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Southern Medical Record

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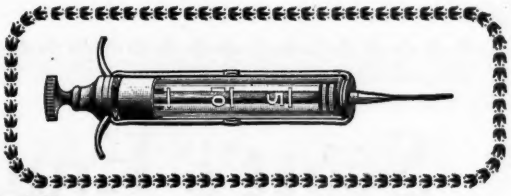

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Southern Medical Record.

A MONTHLY JOURNAL OF MEDICINE AND SURGERY.

VOL. XXVIII. ATLANTA, GA., NOVEMBER, 1898. NO. 11.

Original Articles.

AMPUTATION OF BREAST FOR CARCINOMA; PUS TUBES AND OVARIES REMOVED PER VAGINAM.*

By WILLIAM H. WATHEN, A.M., M.D., LL.D.

Professor of Obstetrics, Abdominal Surgery and Gynecology in the Kentucky School of Medicine; Fellow of the American Gynecological Society and of the Southern Surgical and Gynecological Society; Gynecologist to the Kentucky School of Medicine Hospital and the Louisville City Hospital, etc., Louisville, Ky.

This breast was removed five days ago from a large woman, otherwise healthy, about thirty years of age, married and the mother of one child six years old. She had called the attention of the family physician, Dr. J. W. Irwin, to the tumor about a week before I saw her, and had noticed its growth for more than a year. Her breasts were unusually large; the tumor was in the right breast above and on the inner side of the nipple; it was apparently about the size of a turkey's egg, but could not be distinctly outlined, penetrating imperceptibly into the surrounding tissues. The nipple was not involved, and the skin was not perceptibly changed except over the tumor, and even here it was not changed to the degree usually seen where cancerous tumors have reached this size, which was probably because of the great amount of fat intervening between the gland and the skin. The glands in the axilla could be felt enlarged.

She had been told that it would be necessary to excise but a little section of the breast, hence she was opposed to sacrificing her breast, but her wishes were not considered in the operation, and the entire breast was extirpated, with all fascia covering the pectoralis major muscle and extending down deep into the axilla. The axillary glands were found enlarged, varying in size from a French pea to the end of the

*Reported to the Louisville Clinical Society. Stenographically reported for this journal by C. C. Mapes, Louisville, Ky.

thumb, and several of them were so much degenerated that they had become caseous. After the axillary space had been cleansed of all infection by first dissecting the blood vessels and nerves from the glands which were removed with the fascia and fat, then by following the chain of lymphatics up to and under the clavicle, it was observed that the glands lying between the clavicle and the first rib in front of the vein were enlarged, ranging in size from a grain of wheat to a pea; these were enucleated from the vein and nerve and removed without dividing the muscles, by dissecting with the finger three or four inches underneath the tissues.

While the operation was thorough and all infected lymphatics removed, it could have been performed more easily and with less danger had we followed Halsted's method in removing nearly all the pectoralis major muscle and divided the pectoralis minor muscle, for then we could have exposed the infected lymphatic glands under the clavicle and have removed them without endangering vital structures so much as by enucleating the glands through an opening from the axillary space.

We assume that the patient will do as well without the removal of the pectoralis major and dividing the pectoralis minor as she would with it, for the reason that we removed the superficial surface of the muscle, and because of the fact that the lymphatics all go in the direction of the fascia and there is probably no involvment of the fascia behind the muscle.

Cases 2–3.—These specimens were removed from two patients with chronic pelvic peritonitis and tubal disease. In the first case we removed by vaginal section the left ovary and tube, the lumen of the tube being entirely obliterated. The tube and ovary on the right side were found adherent to the surrounding structures, but having separated them, they were brought into the vagina and found sufficiently healthy to return so that the woman might probably bear children. She was sitting up a week after the operation.

The second case was operated upon five days ago. She is a married woman, twenty-five years of age but has no children. Last summer while at a health resort in Wisconsin she had an acute attack of pelvic peritonitis. Returning to Chicago she consulted Dr. Etheridge who tried to cure her without a surgical operation. She came to Kentucky much improved under his treatment; and by keeping her bowels soluble, abstaining from sexual connection, observing general rules usual in such cases, she continued comparatively free from pain for several months; but when she began having sexual intercouse, taking exercise, etc., the pain returned, the exudations increased, and she was unfit for marital or domestic duties, so an operation became imperative. The uterus was about four inches in

depth, with the endometrium in a septic condition; the cavity was curetted from the fundus to the vagina; then an incision was made in the vaginal fornix into Douglas' pouch and the tubes and ovaries found adherent to everything adjacent. The adhesions were separated and the ovaries and tubes found so diseased that it was necessary to remove them. Clamps were put upon each side and removed after forty-eight hours.

When clamps are applied either in hysterectomy or in vaginal incision, it is advisable to insert the finger above the bite and pack with gauze over the end of the clamp so that the intestines and omentum can not descend and become injured in the clamp. As many pieces of gauze may be packed in as may be necesssary. In removing the gauze it requires care, and if we have packed in several pieces we should not remove all of them at one time, but some pieces when the clamps are removed, then the following day other pieces are withdrawn allowing the tissues to close down gradually as we remove the gauze, and finally in four or five days it is all removed. Better protection is secured by this method; and we will cite an instance where the neglect of this precaution resulted in a condition that might frequently occur if we do not observe this method. We operated upon a patient at the Kentucky School of Medicine Hospital, removing an intraligamentous cyst per vaginam, and using gauze packing as described. My assistant removed the gauze at the end of four days, taking it all out at once. At the end of six days my attention was again called to the patient and she was found suffering intensely, with a large piece of omentum lying in the vagina so constricted in the opening as to require the separation of extensive adhesions around the thickened omentum before it could be pushed back into the abdominal cavity. As a result the woman had within ten hours a temperature of 1048 and pulse of 120. She recovered, but such conditions may result seriously. For this reason the gauze should be taken out gradually, and always insert the finger above to see that no omentum or coils of intestine are in the wound.

DISCUSSION.

Dr. W. C. Dugan: The first case reported is very interesting as all breast cases are. The Doctor stated there was no retraction of the nipple. This is not present in a large per cent. of cases, and it should not be looked upon as one of the symptoms of carcinoma of the breast. It is the exception rather than the rule, and you rarely find it unless you have a large schirrus cancer of the breast, which is seldom found in patients of the age stated. In schirrus where there is much connective tissue retraction of the nipple is common, but in the cellular form of cancers you rarely find it.

One question we should always inquire into, in these cases,

which the reporter did not mention, is trauma. I have recently seen several cases of cancer of the breast, each one of them giving a history of trauma to which the growth could be directly traced. I believe this is a common exciting cause of cancer of the breast. It may be during lactation the child may bite the nipple or trauma from other causes may excite cancerous growth.

I believe in removing the breast in all suspicious tumors where the gland is involved. If you find the breast proper is not involved, then I believe you should simply remove the tumor and leave the breast intact, not mutilating the patient more than is absolutely necessary.

In regard to cleaning out the axilla: I have heard some surgeons contend that unless they could detect enlargement of the glands in the axilla before patient was put on the table they would not invade the axilla. It can not be denied that the glands are frequently infected without any apparent enlargement that can be detected before the axilla is opened. I have operated upon many cases of this kind, in which a careful examination beforehand, lifting up the patient's arm, running my finger along beneath the pectoralis major muscle and the chain of lymphatic glands I failed to find any enlargement whatever, when to my surprise after opening the axilla I found a number of enlarged and infiltrated glands. I take it that we should clean out the axilla in every case of carcinoma of the breast, and not only the glands but the adipose tissue. After dissecting the breast loose from its attachments, the chain of lymphatics leading from the gland to the axilla should be our guide.

One point that should be emphasized is, that in opening the axilla we should expose the vessels at the lower angle of the wound first and then dissect from below upwards for two reasons; first, it is easier to remove the glands and tissue in this way; second, if you are to expose the vein, and there is considerable danger from hemorrhage, if it is exposed from below upwards the hemorrhage can be controlled more easily. In all these cases I have made it a rule to expose the vessels at the lower angle of the wound first, then dissect from below upwards into the axillary space. If the patient's arm is lifted well up by an assistant so that the pectoralis major muscle may be easily recognized, you can dissect well up into the apex of the axilla without working much in the dark. This I have found by experience to be a great aid in the operation.

I have not found it necessary to perform the extensive myotomy that is practiced by Halsted and some others I believe it is unnecessary to remove the muscles unless you can trace the infection down into the muscle and find that the muscle is hardened by infiltration of cells, for, as Dr. Wathen

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states, the lymphatics run out from the muscles into the fascia rather than in the opposite direction.

The subclavicular chain of glands are very small, and must have been rather extensively involved or else the doctor would not have found any of them enlarged to the size of a pea. They must have been considerably hardened and infiltrated, for normal glands of that size would not be detected in the course of an operation.

In regard to vaginal ovariectomy: I have had but little experience in this method. I have operated only once or twice in that way for removal of the tubes and ovaries. I must say that I have not become wedded to that method of operating. I recognize the advantage of a tampon such as the doctor has described, leaving gauze intact so as to prevent herniation and prolapse of the pelvic viscera and omentum. In all the vaginal work I have done, which has been hysterectomy for carcinoma uteri, I have used the tampon, allowing it to remain intact for a week.

Dr. T. P. Satterwhite: I want to make reference to one point: We know that most patients dislike very much to have the breast removed; they suppose themselves to be practically unsexed on one side as far as destroying the appearance of the breast is concerned. Some years ago I had a similar case in an unmarried woman twenty-five years of age. She had a small tumor of the breast which did not give her any especial pain. It was about the size of a hickory nut. I removed this tumor and the tissues as I thought sufficiently far surrounding it In the course of six months it returned, and I told her I thought the breast had better be removed. She declined the operation. I told her the deformity would be less than she imagined, that I would leave the nipple. I dissected up the flap with the nipple, took out the tumor with the breast. The disease in the course of twelve months attacked the rectum and the patient eventually died of carcinoma recti. The deformity of the breast after the operation was very little, the opposite breast being rather small.

Dr. W. H. Wathen: I was pleased to hear Dr. Dugan call attention to the improved technique of these operations in beginning at the lower part of the axilla and dissecting from below upwards, because the work can be done more easily and successfully by that means.

Many doctors make the statement that if they can not feel the enlarged glands in the axilla, none exist, whereas there are many cases where it is impossible to feel a single enlarged gland, and when you open the axilla space thoroughly many glands will be found extensively involved. If you attempt to remove the glands there is no use stopping short of total extirpation of every one in the entire chain of lymphatics.

Probably one reason why some doctors believe that the glands are not always involved, even when the disease has existed for a considerable time, is that they confound the two diseases, carcinoma and sarcoma Carcinoma if considered from its embryology, has its origin in tissues that arise from three blastodermic layers, the hypob ast, mesoblast and epiblast, hence the infection would be conveyed almost entirely through the lymphatics; whereas sarcoma arises in tissue having its origin solely from the mesoblast, hence the poison would be conveyed almost entirely through the veins. Therefore you might have very extensive sarcomatous growth without involvement of the axillary glands, but you will find very often that in sarcoma removed from the breast where there is no primary involvement nor secondary infection of the axillary glands that your patient may finally die from localization of the sarcomatous disease in some other parts of the body, apparently carried through the veins into the system, finally becoming localized at a point most favorable for its development It is the exception to have axillary glandular involvement in sarcoma, and the absolute rule in carcinoma where the disease has extended to any considerable extent.

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Selections and Abstracts.

THE HUXLEY LECTURE OF RECENT ADVANCES IN SCIENCE AND THEIR BEARING ON MEDICINE AND SURGERY.*

By Prof. Dr. RUDOLF VIRCHOW, University of Berlin.

The honor of being invited to deliver the second Huxley Lecture has deeply moved me. How beautiful are these days of remembrance which have become a national custom of the English people, and through which the memory of intellectual heroes is kept alive to posterity! How touching is this act of gratitude when the celebration is held at the very place wherein the genius of the man whom it commemorates was first guided towards its scientific development! We are filled not alone with admiration for the hero, but at the same time with grateful recognition of the institution which planted the seed of high achievement in the soul of the youthful student.

That you, gentlemen, should have entrusted to a stranger the task of giving these feelings expression seemed to me an act of such kindly sentiment implying such a perfect confidence that I at first hesitated to accept it. How am I to find in a strange tongue words which shall perfectly express my feelings? How shall I in the presence of a circle of men who are personally unknown to me, but of whom many knew him who has passed away, and had seen him at work, always find the right expression for that which I wish to say as well as a member of that circle itself could? I dare not believe that I shall throughout succeed in this. But if in spite of all I repress my scruples it is because I know how indulgently my English colleagues will judge my often incomplete statements, and how fully they are inclined to pardon deficiency in diction, if they are convinced of the good intentions of the lecturer. I may assume that such a task would not have been allotted to me had not those who imposed it known how deeply the feeling of admiration for Huxley is rooted within me, had they not seen how fully I recognized the achievements of the dead master from his first epoch-making publications, and how greatly I prized the personal friendship which he extended towards me. In truth, the lessons that I received from him in his laboratory—a very modest one according to present conditions—and the introduction to his work which I owe to him, form one of the pleasantest and most lasting recollections of my visit to Kensington.

*Delivered at the opening of the Charing Cross Hospital Medical School on October 3

The most competent witness of Huxley's earliest period of development, Professor Foster, presented in the first of these lectures a picture of the rapidly increasing extension of the biological knowledge, which must have excited not only our admiration but also the emulation of all who study medicine. Upon me the duty is incumbent of incorporating with this presentment the newer strides of knowledge, and of stating their influence upon the art of healing. So great a task is this that it would be presumptuous even to dare to attempt its accomplishment in a single lecture. I have decided, therefore, that I must confine myself to merely sketching the influence of biological discoveries upon medicine. In this way also will the example of Huxley be most intelligible to us.

Huxley himself, though trained in the practical school of Charing Cross Hospital, won his special title to fame in the domain of biology. As a matter of fact, at that time even the name of biology had not come into general use. It was only recently, as I showed in my lecture "On the Position of Pathology amongst Biological Studies,"* that the idea of life itself obtained its full significance. Even in the late middle ages it had not sufficient strength to struggle through the veil of dogmatism into the light. I am glad to be able to-day, for the second time, to credit the English nation with the service of having made the first attempts to define the nature and character of life. It was, as I then pointed out, Francis Glisson, who, following expressly in the footsteps of Paracelsus, investigated the principium vitæ. If he could not elucidate the nature of life he at least recognized its main characteristic. This is what he was the first to describe as "irritability," the property on which the energy of living matter depends. He thus succeeded in setting aside the mystical idea of the spiritualistic Archæus which Paracelsus and his followers had placed in the forefront of their deliberations, and in locating the principium energeticum in matter itself.

How great was the step from Paracelsus to Glisson and—we may continue—from Glisson to Hunter! According to Paracelsus, life was the work of a special spiritus which set material substance in action, like a machine; for Glisson matter itself was the principium energeticum. Unfortunately, he did not confine this dictum to living substances only, but applied it to substance in general, to all matter. It was Hunter who first announced the specific nature of living matter as contrasted with non-living. But he also did not attain perfect clearness of vision, because in the development of English medicine the idea had been allowed to take root and grow, that life was not bound up with structure, so that Hunter also was led to place a materia vitæ diffusa at the head of his physiological and pathological views. Hence he arrived at

*Croonian Lecture, *Proc. Roy. Soc.* Vol. LIII.

the assumption of the so-called plastic substances in respect of which the blood served both as rallying-point and seat of formation, and so it happened that in place of the old Greek humoral pathology which Paracelsus had overthrown, a new humoral pathology arose—hematology. According to the teaching of Hewson and Hunter, the blood supplied the plastic materials of physiology as well as the plastic exudatas of pathology.

Such was the basis of the new biological method, if one can apply such an expression to a still incomplete doctrine, in 1842 when Huxley was beginning his medical studies at Charing Cross Hospital. Of pathology in England, John Hunter was the accepted master, and so remained for many years thereafter. So great was his influence that Continental medicine also recognized it. To this I can myself testify, as I was at this time at the end of my university studies. It would lead too far afield were I to recount in this place how it happened that I myself, like Huxley, was early weaned form the pernicious doctrines of humoral pathology; it must suffice to say that salvation lay in the same science which had already once before, in the sixteenth century, brought about deliverance from humoral pathology. It then came about that Vesalius threw over the authority of Galen and founded human anatomy upon direct observation, on necropsy. Since then anatomical studies have been much widened and improved. When Huxley himself left Charing Cross Hospital, in 1846, he had enjoyed a rich measure of instruction in anatomy and physiology. How great this was can be gathered from the interesting statistics which Professor Foster has collected with the aid of Huxley's distinguished fellow student, Sir Joseph Fayrer. Of the lectures which junior students attended, 140 in each of the three years of study were devoted to anatomy and physiology. Thus trained, Huxley took the post of naval surgeon, and by the time that he returned, four years later, had become a perfect zoologist and a keen-sighted ethnologist. How this was possible any one will readly understand who knows from his own experience how great the value of personal observation is for the development of independent and unprejudiced thought. For a young man who, besides collecting a rich treasure of positive knowledge, has practiced dissection and the exercise of a critical judgment, a long sea-voyage and a peaceful sojourn among entirely new surroundings afford an invaluable opportunity for original work and deep reflection. Freed from the formalism of the schools, thrown upon the use of his own intellect, compelled to test each single object as regards properties and history, he soon forgets the dogmas of the prevailing system and becomes first a sceptic and then an investigator. This change, which did not fail to affect Huxley, and through which arose that Huxley whom

we commemorate to-day, is no unknown occurrence to one who is acquainted with the history not only of knowledge but also of individual scholars. We need only point to John Hunter and Darwin as closely allied examples.

The path on which these men have achieved their triumphs is that which biology in general has trodden with ever-widening strides since the end of last century; it is the path of genetic investigation. We Germans point with pride to our countryman who opened up this road with full conviction of its importance, and who directed towards it the eyes of the world—our poet-prince Goethe. What he accomplished in particular for plants others of our fellow-countrymen achieved for animals. I recall Casper Friedrich Wolf, Dolinger, Joh. Friedrich Meckel, Carl von Baer, and our whole embryological school. As Harvey, Haller and Hunter had once done, so these men began also with the study of the "ovulum," but this very soon showed that the egg was itself organized, and from it arose the whole series of organic developments. When Huxley after his return came to publish his fundamental observations, he found the history of the progressive transformations of the contents of the egg already verified, for it was by now known that the egg was a cell, and that from it fresh cells, and from them organs, arose. The second of his three famous papers, that on the relationship between man and the animals next beneath him, limned in exemplary fashion the parallelism in the earliest development of all animal beings. But beyond this it stepped boldly across the border-line which tradition and dogma had drawn between man and beast. Huxley had no hesitation in filling the gap which Darwin had left in his argument, and in explaining "that in respect of substance and structure man and the lower animals are one."

Whatever opinion one may hold as to the origin of mankind, the conviction as to the fundamental correspondence of human organization with that of animals is at present universally accepted. All biological science, especially physiology and pathology, creates hence the impulse to corresponding studies, and in particular all that has to be based on experiment must in the first instance be investigated in animals, while all that requires morphological confirmation finds support in comparative anatomy, histology and embryology. The basis of our comprehension of the theory of medicine actually rests nowadays on minute microscopy, for the elaboration of which the animal tissues form an indispensable control-object. Suffice it to say that in scientific biology the division between man and beast becomes less and less defined, but only let it be remarked the division between the abstract man and the abstract animal. It is the same relation as meets us in the differentiation between plants

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and animals. How many definitions of this have been put forth in the course of time, and how one after the other has been wrecked! But if we place a given animal and a given plant side by side we overcome the difficulties which we had only raised by our own definition.

The greatest difficulty in biology has arisen in this way—that mankind, following a natural tendency, has set the search after the unitary basis of life in the foreground of its consideration. As a matter of fact, what is more natural than the conclusion that life as a special phenomenon must also have a special basis, and that the material process of life must be derived from a common cause? During the last century an attempt was made to satisfy this claim by the assumption, with ever-increasing conviction, of a special force —vital force. Nowadays we can still perceive the logical errors which this assumption rendered possible. Time has, however, passed judgment upon it, and to-day no one continues to speak of vital force. And yet the necessity for a single basis of all vital manifestations remains. How is this to be satisfied? This is a question which is not alone of great theoretical interest, but which has become an indispensable foundation for practical work, and particularly for medical practice. But in order to reach this foundation, it is first of all necessary to dispense with all the dogmas of the schools, and to seek to construct an objective picture of the nature of vital processes.

As regards material construction, man and the higher animals and plants are no unitary, simple beings; on the contrary, they are put together from many units. They are hence called organisms. If they possess but one single power which set all their parts in action, it would be impossible to understand how the special kind of activity which each one of these organisms exercises in its individual way comes about. This specific activity is present in the organism not alone in its perfect or fully grown form, but also during its development and growth. How can a single power, whether we call it in the spiritualistic sense spirit, soul, spiritus rector, or, in the physical sense, vital force or electricity, build up such diverse organisms? Or if this power resided in a single organ—were it in brain, or spinal cord, or heart—how could those brainless and heartless creatures be explained which present so abnormal a condition that at the beginning of this century they were the proper battleground of the mystics?

There is here, in my opinion, only one solution possible. The life possessed by the higher organisms is not a single one. Their life and all their activities only become intelligible when we go back to the exact representation, based upon a kind of instinctive observation, of the life of their parts. Each constituent part of a living organism has its special life,

its vita propria. No one of the older authors proclaimed this more distinctly than Paracelsus. But he at once undid this good idea again by attributing to each living part a particular spiritus, a special Archæus. The best of the succeeding biologists were also held by this notion as in a snare; instead of busying themselves in the observation of vita propria—that is, the action of the parts—they continued to devote themselves to research on the Archæus.

The advances in general science based upon personal observation, and particularly those in medicine, have completely turned the attention of true observers to the study of individual parts. As I pointed out at the Medical Congress at Rome,* it stands most clearly revealed in the history of pathology that the division of the body first into larger regions (head, breast, abdomen, etc.), then into organs, then into tissues, and finally into cells and cell-territories, was the first step which opened up to us the comprehension of disease. The study of regions was followed by that of organs, and this again by that of the tissues, and finally by the cellular theory. But what is true of pathology must hold also for physiology, and as a matter of fact physiology has passed through the same developmental phases. One gradually comes to understand that the life of the individual parts is perfectly clear if one looks away from the Archæi of the organs, or the tissues, and keeps in view only the life and activities of the single cells. For the life of an organ is naught else than the sum of the lives of the single cells which are gathered together into it, and the life of the whole organism is not an individual but a collective function.

If such a collective being is analyzed, no matter whether it be the whole organism, or a single organ, or only one tissue which is presented in its vital activity, the first requisite for a correct interpretation is that one should discard the fabled unity, and should regard the single parts, the cells, as the factors of existence. Single cells can be separated out even in a complex organism, but we should with difficulty arrive at a satisfactory theory if we did not also meet with single free-living cells in Nature. These have provided the first basis for objective investigation. Uni-cellular plants and animals have during this century been continnally more fully and better studied. Botanists and zoologists have become the teachers of physiologists and pathologists. The ova of animals and the corresponding germ-cells of plants have bridged the gap between isolated living cells and higher organisms. It was the recognition of this fact which first raised the famous theorem of Harvey to the high position which it merits.

In a medical school, where the teaching is almost entirely concerned with human beings, we might put this sentence at

*Morgagni and Anatomical Thought.

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the head of the lesson: "The organism is not an individual but a social mechanism." An exact anatomical analysis of this mechanism always brings us at last to cells; they are the ultimate constituents of all tissues as they were their origins. Hence we call them the living elements, and hence we regard them as the anatomical basis of all biological analysis, whether it has a physiological or a pathogical object in view.

In relation to this two propositions must be stated: (1) That every organism, like every organ and tissue, provided it is alive, contains cells; (2) that the cells are composed of organic chemical substances, which are not themselves alive, but the mechanical arrangement of which determines the direction and power of their activity.

The first proposition has of late slowly come to be realized. Schwann, who recognized the origin of tissues from cells, still clung to the opinion that in the further development of many tissues the cells were used up. Among these he reckoned that important group which has subsequently become known as the supporting tissues, because it ensures form and stability to single organs, and to the whole organism. First among these stand the osseous and connective tissues, which also form so large a fraction in the quantitative constitution of higher organisms. The conception of the osseous and connective tissues as free from cells must now be given up. Where formerly only empty spaces or mere leaks (lacunæ, holes) were seen in the tissue, we now can demonstrate actual cells. We can even isolate them. Hence it is now desirable that the name "tissue," in the sense of living tissue, should be applied only to such parts as contain living cells. Outside the cells the tissue may contain a more or less rich share of organic (chemical) material, but this intercellular or extracellular substance must be regarded as an additional endowment, and not as a vital factor. Such parts as arose originally from living cells, but of which the cells have perished, must be excluded from biological consideration. As examples may be adduced the epidermis and the hair belonging to it, together with the enamel of the teeth. These consist in reality of dead tissue.

As regards the second proposition that no living organic chemical substance exists, the fact has been objected that all living matter is put together from organic chemical materials; but whoever raises this point must have well-nigh overlooked the fact that these two kinds of substances, the living and the non-living, can not be identified with one another. In spite of chemical similarity or even correspondence, they exhibit recognizable differences, not alone physiological, but also mechanical and physical. Thus since the application of dyes has secured us a glimpse of the variety of the finer mechanical, or if one may say it molecular, arrangements of matter, it has

become possible to differentiate living and non-living parts de visu. We are admittedly only on the threshold of these investigations, but the latest researches upon ganglion-cells have shown that even beyond the effects of staining differences between living and no-longer living parts may become optically recognizable.

The enthusiasm with which for centuries the doctrine of formative principles and nutritive materials was built up has already become much abated, and has, in part, been entirely abandoned, through the knowledge that no single chemical substance, no kind of nutritive or formative material which can be employed as such, and without further change, for the origination or formation of cells, has ever been found outside the living organism. And yet a chemist of Liebig's importance actually believed that fibrin could be conveyed directly from the meat consumed into the juices of the body, and thence deposited in the tissues. This was a misconception—a relic from the time of the old humoral pathology—which regarded the living body and its constituent parts as arising simply from the coming together of a few ground-substances (humores cardinales). Hence arose the doctrine of plastic materials which were pre-existent in the food and blood. With an obstinacy which was only surpassed by their superficiality, these theorists remained convinced that the plastic materials as such effected the construction and maintenance of living matter. They failed to see that the nutriment taken in had first to be prepared by special juices secreted by the cells of the digestive organs, and that both the digestive material and the plastic substance of the blood were rendered assimilable only by means of a new change, which had to be effected by the agency of the tissue-cells.

The doctrine of plastic material appeared to have gained new strength through Schwann's cell-theory. One must be careful not to misunderstand this designation. Since the cellular theory of animal and plant life has been established, many have maintained that Schwann's cell-theory is identical with it. Not only is this not the case, but the two stand in exact opposition to one another. Schwann assumed, and believed himself to have directly observed the process, that cells arose in undifferentiated matter, in a fluid or a semi-solid mass, in the following way: First, small particles of a firmer kind were separated off, then these came together into little heaps or lumps, by the internal transformation of which a cell-nucleus gradually arose. Round this a new precipitate of firmer substance now slowly accumulated, and from this arose the body of a cell. Hence the original amorphous substance would be the special constructive material, while the nucleus was the true cell-builder; Schwann called the former cytoblastem, the latter cytoblast.

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It is obvious that from these premises people must have been logically led to the conclusion that every form of organic tissue or organism, every kind of new cell must be separated from the preceding by a definite gap (hiatus), so that each new formation must be grouped as a discontinuous vital origin. Strangely enough, this classification arose and was accepted at a time when Darwin was already at work proving that new species arise by the modification of pre-existing forms. But Schwann's cell-theory was in truth a resuscitation of the archaic doctrine of spontaneous generation (generatio æquivoca, epigenesis). With the rule of such a creed Darwinism was incompatible.

The supports of this generatio æquivoca have been, as far as zoology is concerned, gradually demolished. The formation of tissue-cells from the egg and its partition has been observed throughout the whole animal kingdom. Apparently eggless animals, such as the cestoids and trichinæ, have one after the other been brought under Harvey's law; we know their eggs, their embryos, and their wanderings. There remains, in fine, but one great domain, though this is of the highest importance; it belongs particularly to pathology, and is that of the plastic exudates, which accompany the most important clinical processes, particularly the inflammatory.

It will readily be understood that so essentially pathological a subject would have but little interest for pure natural philosophers. They left it to medical men, who have to occupy themselves with it all day long. But in medicine this territory was held sacred; no one doubted that therein spoke old, well-attested experience. We old students were endowed with the so-called theorem of the plastic exudates from our earliest studies. Translated into our latter-day parlance, such a theorem would recognize discontinuity in most pathological new formations; it would establish—and this is well worthy of note—the grounds for the dogma of the origin of life from non-living matter. Experience has taught us the exact opposite.

Permit me here, gentlemen, to speak a little more personally than is elsewhere my intention. Perhaps it will be more intelligible to the students of this hospital, and will make more impression if I narrate how I myself arrived at quite other views.

It was towards the end of my academical studies, more than fifty years ago, that I had to take up the work of assistant in the ophthalmic clinic of the Charite Hospital, at Berlin. My attention was at once directed to the diseases of the cornea. We had severe cases of keratitis, but I saw in them no exudation; numerous cataract-operations were performed and the wounds closed, but not by plastic exudation; this was absent from all corneal scars. Could this be explained by the

circumstance that the cornea, apart from its circumference, is a non-vascular tissue? My interest was at once focused on the non-vascular tissues. I turned first to the articular cartilages, and behold, here also I found the greatest changes without the presence of exudation, or, at any rate, of plastic exudation. I need only recall the form of inflammation which I named arthritis chronica deformans, and which is described by French physicians as arthrite seche. My experimental studies on the inflammation of the walls of blood-vessels showed that the equally non-vascular intima of the larger arteries, and in part also that of the veins, can undergo great changes without even a trace of exudation being produced. Later on anatomical investigations on endocarditis led to the same result, provided that parietal thrombi were not regarded as exudations. But in all these cases and in every place there were found changes in the tissue-cells, active such as swelling, multiplication of nuclei, etc., or passive as fatty degeneration.

I next turned my attention to vascular organs, and in particular to those which were recognized by pathology as the common seats of exudation-processes. I refer, first, to the medullary infiltration of the lymphatic (follicular) tissues of the intestine and mesenteric glands in typhoid fever so strikingly depicted by the Vienna school; instead of the amorphous albuminons exudate which was described, I found only cells, and cells of the same kind as those which are normally present in these situations. The same was revealed in the so-called caseous exudates which were at one time ascribed to scrofula, at another to tuberculosis; the cheesy material was admittedly in the main amorphous, but it was in reality not an exudation at all, above all, not a primary product of disease, but rather the secondary product of degenerative necrobiotic changes in parts of the tissues, which had formerly been organized, and not infrequently actually hyperplastic.

It is not necessary to go further into details in order to show how great is the realm of this pseudo-exudative process. But I can not help referring to another series of morbid processes affecting the bones. It was whilst studying rickets that I first learnt the biological significance of the cartilage-corpuscles, the nature of which had till then been interpreted in very different ways. I believe that I was the first to distinguish in these corpuscles what must be actually recognized as cells from the merely capsular and extracellular coverings. The rachitic disturbance now brought into fullest evidence an appearance which was repeatedly misunderstood even by later observers; this was the increase of these cells by division, and the consequent growth of the cartilage.

It was not difficult to follow out the direct transition of the epiphysial cartilage into the periostem of the neighboring bone, and thus into connective tissue. At this time the whole

world was convinced of the correctness of the statement made by Duhamel that increase in thickness in the long bones was affected by the periosteal vessels exudating a nutritious juice out of which the new bone-substance was formed. Pathologists had extended this formula to periostitis and the formation of exostoses and hyperostoses; they assumed that between the periosteum and the bone a plastic exudation was excreted and stored up, in which the new osteophyte arose by secondary organization. The consequence of my investigations was that in not one of these spots, neither in the cartilage nor in the periosteum, neither in normal growth nor in rickets or periostitis, was organization preceded by the presence of a recognizable amorphous exudation. On the contrary, it was indubitably shown that the first stage of the changes was an active productive process of cell-multiplication; that at the same time the intercellular substance altered in character and underwent a series of successive changes till it assumed an osteoid appearance; and that then, and not till then, followed calcification and true ossification. There was also no difficulty in adducing the proof that the separate stages of these processes in cartilage and in periosteum ran a perfectly parallel course, although the new tissue was in the one case at first true cartilage, in the other only cartilage-like. If one wishes to designate this process in general it must be called proliferation. Most of these processes are of the nature of proliferation. Whoever calls the proliferative layer an exudation will never obtain an objective view of the actual proceeding.

There is thus not the slightest necessity for the genuine observer to hold to the arbitrary and totally erroneous formula of a plastic exudation. There is no such thing as a plastic exudation which is ever simply amorphous; the cells which may be found in it have not arisen there. With this proof, which can be obtained in numberless other places, the doctrine of the discontinuous origin of pathological new formations is set aside. Every such new formation presupposes a tissue from which its cells arise; this is its matrix. There is no difference in principle between the descent of men and animals from one mother and the descent of pathological new formations from one matrix. Pathology has been somewhat late in arriving at the knowledge of this correspondence, but I think that it has acquired especial value for biology in general.

In order to avoid misunderstanding, it may be noted that not every living cell is capable of becoming a matrix. All cells which are destined for the highest animal functions prove sterile, or at least very hypothetically capable of proliferation. Ganglion-cells, primitive muscle bundles, red blood-corpuscles do not come under consideration as regards the theory of

pathological descent. The more indifferent cells, on the other hand, above all those of cartilage, connective tissue, and epithelium, exhibit a market proclivity to bring forth new cells. Many cells again, such as bone-corpuscles and fat-cells, require a special preparatory metaplastic stage before they can produce a new brood.

Proliferation is an active property of special cells. That it can not be performed by all cells alike in no way alters the fact that it can only be performed by cells. It is just as little a function of an entire organism, for this itself would then have to be unicellular. In this property lies the explanation of the origin of a whole organism from a single egg-cell, that wonderful process which comes to pass but once in the life of animal. Once tissues have arisen each cell of a matricial tissue may in respect of proliferation be compared to an ovum; it brings forth a new progeny from which new tissue grows. This tissue bears, as a rule, the stamp of its matrix—it is built on the maternal type. This is the nature of descent, and herein lies the key to the knowledge of heredity, that puzzling appearance with which mankind has ever busied itself.

According to the humoral theory heredity was derived from the body-fluids and in particular from the blood. According to this idea the blood furnished the means of the continuance of the family and the race; blood-relationship explained the similarity not only of the juices but also of the organs and the whole body. The blood according to its nature determined the goodness or badness of the organization; noble blood generated noble men and healthy organs, bad blood a debased posterity and organs predisposed to disease. In scientific works naught remains of these fantastic surmises; they persist like a superstition in lay circles, but no one now maintains their correctness in serious debate. In their stead has arisen the recognition of the particular value of the mother tissue and its cells. These are the factors of inherited properties, the sources of the germs of new tissues and the motor power of vital activity.

During the development of a higher organism the constitution of the individual tissues changes; they become differentiated by means of metaplastic processes which are in their turn connected with cells and cell-territories. Thus it comes about that people have for ages spoken of dissimilar parts. The complete full-grown organism is built up of similar and dissimilar tissues; their harmonious working gives the impression of a unity of the whole organism which is as a matter of fact non-existent. For the further the organism develops the more its social constitution comes into evidence. It consists of innumerable independent parts which together constitute a single social body. If we take the ultimate elements of these parts we must call them all without exception cells, for cells

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alone are truly alive and scientific judgment is in the last instance concerned with them.

So little is the whole organism a definite unit that the number of its living constituents is in the highest degree inconstant. Looking at the gross structure of organs we are accustomed to regard a certain number of them as typical peculiarities of human beings or the various genera and species of animals. We expect to find two of each paired organ and one of each unpaired in a single individual. Man, like all other mammals, has a fixed number of bones and teeth, and these numbers are rightly used as diagnostic of man or of the particular variety or species of animal. But these numbers form no essential condition of existence; a man with six fingers or seven toes remains a man, just as a lung with supernumerary lobes or a kidney with an excess of coni medullares remains a lung or a kidney. A woman with three, four or even more mammary glands is thereby no more a lower animal than a man with a tail would be. These are theromorphs ("sports") which can have no influence on our opinion as to the sex of the affected individual or its position in the animal scale.

But it will be a long time before general opinion on the significance of "sports" will, even among experts, become unanimous. One sect will connect them with descent, and see in them a proof of atavism; while the other will regard them only as a pathological formation, and will trace this back to an acquired lesion. During the last century we have gone through violent disputes as to whether certain malformations were inherited or acquired. Those who pinned their faith to inheritance had very generally the arriere pensee that the variation was atavistic, and the question soon presented itself as to whether the atavism was derived only from human ancestors, or whether one would have to go back as far as the lower animals to account for it. A universally valid explanation of theromorphism has not yet been found. In my opinion it will never be found. Each single example must be separately studied and explained, and the general value of this explanation will be by no means increased if we find atavism in any single case. Doubtless an acquired variation can also be transmitted, and the circumstance that it is animal-like (theroid) does not go to prove a not acquired but atavistically transmitted condition. In connection with this I may refer to my paper on Race Formation and Inheritance.* I can here discuss only the principal ground for the disputes regarding hereditary diseases which are special to pathology.

Medical men are accustomed to describe as hereditary all diseases which reappear in different generations of the same family. Thus one speaks of hereditary arthritis, hereditary

*Published in the "Bastian-Festchrift," Berlin, 1896, pp. 33-88.

tuberculosis, hereditary cancer. It is in fact not difficult to produce genealogical tables which demonstrate the recurrence of a paternal or maternal disease in children or grandchildren. Much trouble has been devoted, in my opinion without result, to seeking the germs of such diseases in the ovum or the semen. One is hence compelled to pass on to generations of cells which took origin after conception. Here we reach what Roux has designated the post-generative formations. The further we pass away from the time of conception the more numerous examples do we find of alterations in the formation of cells and in the formation of embryonic tissues. But there is at the same time the greater possiblity of the alteration having arisen after the formation of the first cells, and hence that the existing cause may have commenced to act at that time. If we set aside this possibility nothing else remains but to assume that from conception, or even from the organs which produced the ovum or the spermatozoon, a predisposition is transmitted which is already present in the earliest cells, even if it can not be recognized in them.

Upon this theory are built up all interpretations of the inheritance of pathological and, we may add, physiological structures. There are, for example, many extraordinary anomalies in the disposition of hair, either through excess or through defect, and nothing is more common than to see the inherited transmission of such anomalies. But hairs are post-generative structures, and a disturbance in their development can make its first appearance only in a latter period of fetal life; not infrequently, indeed, it is first seen after birth. If such a peculiarity recurs through many generations in the branches of a family or a race it is called hereditary, and referred to a hereditary predisposition. But as undoubtedly excesses as well as defects in hairiness are brought about by acquired disturbances, such as actual diseases, it becomes necessary to seek a recognizable cause for such great anomalies as well. If such an one is found, the aid of a predisposition need not, as a rule, be invoked; one may be quite contented with the cause, which is then the causa effcienes.

Very recent medical history affords the most striking example of a rapid and comprehensive change in opinion regarding a disease formerly regarded as hereditary. Leprosy has for thousands of years passed as a contagious disease. But when about a generation ago the number of lepers in Norway increased to an astounding extent, and one family after another was seized with the malady, the question once more came up as to its hereditariness. Zealous investigators ransacked genealogical tables and church-registers, and families were discovered in which leprosy had persisted for decades, or even centuries. So universal was this conviction that the government, with the consent of the clergy, wished to promulgate a

marriage-forbidding decree; only a small majority in Parliament threw out the proposition. I was then requested by the government to travel through the leprous districts and to make a report; I succeeded in collecting a certain, though small, number of indubitable cases in which all suspicion of inheritance could be excluded. These were in particular persons who came as healthy adults from quite leprosy-free neighborhoods into the infected districts, and after a long sojourn there developed leprosy.

A few years later Armauer Hansen discovered the leprosy bacillus. Medical opinion changed in a moment. The venerable idea of the contagiousness of the disease was revived. Inheritance was denied and predisposition vanished from the treasure-house of dogmas. I will not assert that the grounds for embracing the present view are absolutely convincing, but I am positive that it is far to be preferred to the dogma of inheritance. And it is an experience instructive to all of us that one single fact, the discovery of a causa viva should have sufficed to dash down the apparently best-grounded theory. The safely established recognition of a known cause has at once converted leprosy from an inherited into an acquired disease.

A similar thing happened a few decades earlier with two skin-diseases which were, according to the views of humoral pathology, traceable to a change in the blood, a dyscrasia, namely, tinea (favus, porrigo) and the itch. The first actually bore the name of tinea hereditaria, or in German erbgrind. But the microscope revealed to Schonlein that favus arises from a mycelial fungus, and as regards scabies the popular Italian view was confirmed, namely, that a mite (Acarus sarcoptes) was its cause. So unstable are the most plausible theories in the light of an objective, practical knowledge.

Exactly the same experience has been met with in relation to certain diseases of the hair. When fungi were found on the hairs, no one cared any more about predisposition, although this possibly does occur. It is certain that there are parasitic forms of alopecia. But fungi can not be found in every case of alopecia. Still less is this the case in anomalies of the hair associated with excessive growth. Here no other explanation is possible, except the assumption of a predisposition. This holds equally for hirsute races and for families of hairy men as well as for those single hairy cutaneous patches (nevus pilosus) which are regarded as hereditary. The factors in the predisposition are the hair-roots, and moreover those which, although arising during fetal life, belong also to the post-generative group, since they are called later into increased activity.

The general cutaneous covering, in brief the "skin," although doubtless a kind of unitary structure of generally

similar type, is nevertheless in a double sense a socially constituent organ. Not only is it composed of numberless independent cells and cell-territories of dissimilar kinds; apart from the vessels and nerves, of the connective tissue, the cutis proper, and the horny epithelial tissue, which forms also hairs and glands, the individual constituents of the skin have a special disposition and are exposed to various external and internal influences. This is best shown by the numerous morbid states to the definite scientific classification of which English dermatologists so early devoted themselves. The existence of maculæ, papules, pustules, and all the various other kinds of skin-spots is demonstrated by the fact that in the skin a large number of little communities may be noted from the first as independent or hereditary factors of a particular predisposition. When mothers' marks (nevi), hairs, or even spines grow from them, it follows that in spite of their common origin there must exist a lasting difference between the various localities.

There is another highly remarkable question which every year claims the attention of medical men more and more; this is what was described in the old medicine as aberratio loci, in the new as heterotopia. It has long been known that hairs are present, not alone on the external skin, to which they properly belong, but also in internal organs where they are quite out of place; and further, that other cutaneous structures, such as epidermis, sebaceous glands, and cutis appear in such places. We unite this whole group under the general term "dermoids." Modern histologists have long struggled against this theory of aberration, but they have finally had to quit the field, and the view has become dominant that as a matter of fact even in fetal life smaller or greater rudimentary fragments can be separated from their natural places of abode, and removed to other spots, where they, so to speak, find a new home, and can undergo all the further changes which are dependent on their cutaneous nature. It is thus that cysts and other tumors can arise from them.

The most remarkable examples of such heterotopias are afforded by certain glandular organs which under normal conditions present communities of similar parts, arranged in special divisions. Among them a high place is taken by two organs which have recently demanded much attention, the thyroid and the suprarenal glands. On their surface may often be observed the pushing forward and progressive isolation of separate parts in the form of nodules or small lobes. But occasionally these nodules pass completely out of association with the main body of the gland, and are found disconnected in a perfectly strange place more or less removed from their seat of origin. The farthest journeys are those of the

broken-off nodules of the suprarenals; their wanderings lead them to neighboring spots on the kidneys, or even into the interior of those organs, and in other cases over the kidneys into deeper parts of the peritoneum as far as the pelvis. And at all these places they may undergo further change, thus affording starting points for tumor-formation.

The same wandering has long been known in respect of teeth, and one knows that large tumors can arise from misplaced tooth-germs. The like holds with regard to cartilages, in which similar separations are noted in fetal life. The history of rickets has shown that islands of cartilage which were originally connected with the primary cartilages of the epiphyses or diaphyses come later in the course of bone-growth to lie in the interior of the bones, completely separated from their matrix. From them may arise other new formations such as enchondromata and osseous cysts.

Extraordinary, even astonishing, as many of these cases are, they lose the character of perfect strangeness which they exhibit on superficial examination when we recall a frequent heterotopia which was produced at first rather by accident, then in surgical practice, and finally experimentally, and which is known by the name of transplantation. Since the grafting of pieces of the epidermis has come into use in rhinoplasty, and has been applied, often with great success, to the healing of refractory ulcers, it is no longer surprising to think that living pieces of tissue may continue to exist in unwonted situations, and can there undergo further development. Experimentally— and this has also become important in surgical practice—the first place under this head is taken by the transplantation of periosteum, which can be carried into every possible corner of the body, even through the circulation into the lungs, and which in all these places conserves its vitality and also its power of serving as a matrix for osseous tissue.

In my opinion, the bearing of these observations upon medical theory has been overrated, in that a property possessed by the transplanted tissue, to-wit, the property of forming a tumor by proliferation, has been applied to the explanation of tumor-formation in general. This is a mistake. Transplanted tissue has no fresh properties beyond those of the mother tissue from which it is separated.

That a sarcoma can arise from a nevus is only possible because the latter is a part of the skin, and because the skin itself can also produce sarcomata. A cartilaginous tumor can arise from an aberrant piece of cartilage in the middle of a bone, and give rise to an enchondroma, but it may also grow out as a simple cartilaginous hypertrophy (ecchondrosis) from permanent cartilage. A dermoid cyst can serve as the basis for the outgrowth of a cutaneous horn, but cutaneous horns and spines can also grow out of ordinary skin. In

each of these cases there is only the realization of a possibility of formation which is present in the matrix in general. At the same time each of these cases illustrates the law of the vita propria of the tissues and of their activity linked to this life.

It is not without great scientific and practical interest to reflect that these observations illustrate another ancient doctrine, the doctrine of parasitism. This doctrine also is traceable back to Paracelsus, who wished to have disease in general regarded as a parasite. One century after another spread this theory abroad, or at least kept its memory green, although there is a fundamental error of logic in assuming the universality of parasitism. For if the living organism is constituted by separate and independent living parts, each of which nourishes itself, and of which most can propagate themselves and perform their special functions, each one of these individual parts must occupy the position of a parasite with respect to the others: it lives on and lessons the common stock of nourishment. The generally accepted view regarding parasitism postulates at the same time the harmfulness of this condition. In reality, every part is endowed with individual life so that it can act prejudicially on the remainder of the organism if its activity becomes excessive or defective. A nevus that becomes a sarcoma can assume a really hurtful significance. Hence it is requisite to remove the sarcoma, but it is not advisable to remove every nevus. Only an access of caution can lead to an operation which finds its sole excuse in the possibility that nevus can conduce to the formation of a sarcoma. In like manner every excessive proliferation (luxuriation) can act harmfully; it may then be described as malignant. But many proliferations are useful, benign or even salutary, as, for instance, the scars which cover a loss of substance. It is just for the sake of a trustworthy prognosis that one must be extremely careful in the application of designations which group whole categories of morbid processes under a common aspect.

The idea of parasitism which we have here discussed in regard to the relation between different parts of the same organism fits in much better where living organisms of a different variety or species enter into an organized corporation, and continue their special life in commensalism. The animal parasites, which exist as entozoa in man and other animals, have been longest known. Since the end of the last century our acquaintance with these entozoa has greatly broadened. Many structures which were formerly regarded as mere bladders (cysts) have been recognized as cestoid worms (entozoa cystical). The trichinæ, apparently sexless animals living in the interior of muscles, were first discovered in this century at Edinburgh; later experimental research succeeded in proving

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that after the consumption of infected meat these little worms rapidly became sexually ripe in the bowel, and produced not alone ova, but also living embryos and larvæ. Thus one comes to the worms which live in the blood, distomata and filariæ, and which later wander into the tissues. They all have a period during which they have their dwelling as organozoa in the midst of the living tissues of the organism, and become so perfectly incorporated that they carry on their own lives just like the proper cells. Quite new and pertaining exclusively to the investigations of our own time are the parasitic protozoa, beings of so rudimentary a kind that their position in the biological system is even yet not quite clear. Chief among these are the protozoa of malaria, quite microscopical organisms, many of which are such pigmies that they can penetrate into the smallest cells, such as the red blood-corpuscles. The darkness which for thousands of years had enveloped a group of most dangerous diseases—the tropical fevers—has been dispelled by the discovery of these tiny creatures. Important links in the history of these parasites are still wanting; we know nothing definite as to their origin or their career outside the great organisms which are their temporary dwelling-place, and nothing, also, as to their mode of action within these organisms, but we hold the threads by means of which perfect knowledge must be attained.

Lastly comes the equally new field of microscopic plants which appear sometimes as mere grains (cocci), at others as minute rods or chains (bacilli), and from which many of the most severe diseases, the elite of the parasitic infectious maladies, take origin. Their recognition began with the study of two very great and most widely spread processes, fermentation and putrefaction. It will ever remain the imperishable merit of Pasteur, not only to have firmly established the dependence of these processes on the activity of microbes, but to have elucidated the further life-history of the germs and their power of producing active chemical or physico-chemical substances. Here for the first time were subjected to experiment parasitic beings which live and carry on their work outside the organism. Hence has been attained the wonderful result which has unlocked new methods both in medicine and in technical science. Above all, the results of microscopical research have been supported by trustworthy experiments, and their significance raised above all doubts; hence pathology in particular has won in directions which had hitherto been shunned by all who studied the nature of its processes, a clearness and certainty which has been reached in few other fields.

The first great stride in the special domain of pathology was made in veterinary medicine. The discovery by Brauell of the anthrax bacillus opened the long series of new, and as we now call them, pathogenic bacilli. It would lead too far afield to

refer to all of these, or even to enumerate them; it must suffice to mention the two severest diseases, the dreadful effects of which are accounted for by the action of bacilli—tuberculosis and Asiatic cholera. In both cases it was Robert Koch who was fortunate enough, by means of careful, and in part very delicate procedures, to demonstrate the constant presence of certain bacilli in the organs of patients. At the same time it became plain that in spite of the presence of bacilli in both diseases a totally different kind of infection could be recognized in the two; thus, while tubercle bacilli invade the organs, and therein exhibit their deadly action, the cholera bacillus remains almost exclusively in the intestine, and develops more after the manner of an infusorial plant.

For our discussion to-day it is inadvisable to go into minuter details. Only a few of the greater landmarks can be referred to. One of them I will mention but briefly, as I have written many long papers upon it: the necessity for distinguishing between the cause and the essential nature of infectious diseases. Parasitic beings, including, of course, bacteria, are never more than causes; the nature of the disease depends upon the behavior of the organs or tissues with which the bacteria or their metabolic products meet. From my point of view this distinction is of cardinal importance.

Both my other landmarks require somewhat fuller statement. The first is the general relation of the smaller parasites to the diseases determined by them. Under one name, which reaches back even into the old days of humoral pathology, and which I was the first to introduce into common parlance, are grouped all the processes which are produced by the invasion of morbid substances, under the general designation of infection. The Latin inficere means as one should say to "dirty." The polluting substance (res inficiens) has been called for ages dirt, impuritas. The products of putrefaction (materiæ putridæ) served as its prototype. In Greek they were called miasms (from μιαίνω, inficere), so that these latter names were applied chiefly to such uncleanness as had been produced outside the body. That which had arisen inside the human or animal body was called contagium. Both miasmatic and contagious substances produced by their penetration into the body severe attacks recalling poisoning. To distinguish such a substance from a true poison (venenum) it was designated a virus. The relationship between infection and intoxication was presumed, but it was not without good reason, considering the origin of the impurity, that the difference in designation was retained.

Among the innumerable infectious diseases it was the contagions which, owing to the associated danger to health and life not for individuals only, but for numbers of men and animals, came most prominently to the front. Thus the remark-

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able property was observed in contagia that they multiplied in the body, and so besides infection as such produced an immeasurable quantity of fresh virulent substance. In this respect they approached living beings, and the thought arose that they themselves were alive (contagia viva). With the discovery of parasitic animals and plants this conjecture soon became a fact. Nothing was easier than to generalize this fact and to assume the presence of independent organisms in each contagious disease. The younger generation of doctors and students disregarded with fiery enthusiasm the necessity of a practical proof, and was filled with the conviction that all infection depended on the invasion of parasitic organisms. And since it was just the severest infections which were produced by the minutest plants and in which bacilli and cocci, or as they are called for short, bacteria, were found in greatest abundance there was circulated for some time that beatific axiom, "Infection is pollution by bacteria."

It was known, however, that parasitic animals and protozoa can also give rise to infection, and that between bacteria and fungi there is more than a slight difference, but for convenience the name of bacteria is retained as a general designation. Further, a peculiar circumstance happened in that for most of the so-called bacteria there were no botanical names. Owing to the novelty of the circumstances in which they are placed, botanists have not even yet succeeded in their customary duty of giving every new plant it special name, of determining its genus and species, and of assigning it to its proper systematic situation. This can easily be understood and forgiven. But it does not in any way alter the erroneousness of a method which attributes every impurity to bacteria on the sole ground of its contagiousness. It may be said that a contagious disease affords suspicions of a bacterial origin, but it should not be called simply bacterial. To do so hinders further research and lulls the conscience to sleep.

Some of the most important contagious diseases have succeeded in resisting the struggle to find in them a parasitic contagium. For example, many have been the sanguine hopes of finding the parasite of venereal disease and as many have been the failures. The coccus of gonorrhea alone has been discovered; the bacterium of syphilis itself remains a pium desiderium. With certainty was it expected that a pathological parasite would be tracked in variola; more than one bacterium was actually found, but none pathogenic. In hydrophobia (lyssa, rabies) all appearances seemed to promise that it would prove to be a microparasitic disease; its contagiousness is undoubted; even a vaccine has, as with smallpox, been prepared, and yet no one has been able to cultivate a specific bacillus. And the same is the case with some of the most dreaded contagious diseases. Painful as it may be one can do

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nothing but wait, observe, and experiment. Perhaps pathogenic bacteria will be found, but as long as they are not discovered all assumption is useless if not dangerous. To have learnt this is a good omen for a mighty stride in biological methods.

The other, much-further-elaborated point in the study of infectious diseases is the question of the mode of action of infection. As long as infection by animal parasites was regarded as the type of infection in general, the destructive action was described as the result of a mechanical action just comparable to a bite or devouring. But the exact study of the larger entozoa and organoza soon brought about a complete conversion. Neither the Tænia solium nor the Tænia echinococcus possesses an oral opening. They undoubtedly take in nourishment and draw it from their autosites, or, as they are poetically called, their hosts, but this applies only to the absorption of fluids. The feeding of bacteria and other vegetable and plant-like parasites has to be regarded in the same way. They certainly injure the tissues and organs in which they reside by the consumption of important materials, but their action is not limited to this. This much we have already learnt in the study of fermentation and putrefaction. It is admitted that organic matter is destroyed by them, but in addition they produce new substances, some of them eminently poisonous. Thus, it has been known for centuries that alcohol is produced by fermentation. The putrefaction-poisons could for a long time not be isolated; first Selmi and then Brieger achieved this result. Gradually one ptomaine after the other was found; for the whole group the new term of toxins has been introduced by Brieger instead of the name virus. They are in part crystallizable, invariably diffusible, chemical substances which are bound up neither with cells nor other formed elements, though they are produced by the cell-action of the parasites. They are nowadays described by preference as metabolic products, a perfectly platitudinous notion which has far more sound than sense. In former times people were contented to call them secretory products, and I venture to believe that it is better to stand by this term in order not to lose the analogy with glandular secretion.

There are thus two sides to infection; on the one the actual living parasites, on the other their often poisonous secretions. In the individual diseases now one, now the other property comes to the front. In the case of the hematobiotic parasites poison-formation may well as a rule count as more important; with those that live in the organs the deprivation of nutriment is much more immediately evident. The invention of artificial nutritive media for bacteria has now provided us with a convenient field for research and observation regarding all these questions.

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It would be called carrying coals to Newcastle were I to sketch in London the beneficial effects which the application of methods of cleanliness has exercised upon surgical practice. In the city wherein the man still lives and works who by devising this treatment has introduced the greatest and most beneficent reform that the practical branches of medical science have ever known, every one is aware that Lord Lister, on the strength of his original reasoning, arrived at practical results which the new theory of fermentative and septic process fully confirmed. Before any one had succeeded in demonstrating by exact methods the mircrobes which are active in various diseases, or in establishing the special functions that they perform, Lister had learnt in a truly prophetic revelation the means by which protection against the action of putrefactive organisms can be attained. The opening up of further regions of clinical medicine to the knife of the surgeon and a perfect revolution in the basis of therapeutics have been the consequences. Lord Lister, whom I am proud to be able to greet as an old friend, is already and always will be reckoned amongst the greatest benefactors of the human race. May he be long spared to remain at the head of the movement which he called into existence.

It remains for me to say a word concerning the other great problem, the solution of which the whole world is awaiting with anxious impatience. I refer to the problem of immunity and its practical corollary, artificial immunization. It has already happened once that an Englishman has succeeded in applying this to the nearly complete destruction of at least one of the most deadly infectious diseases. Jenner's noble discovery has stood its trial as successfully, except in the popular fancy, as he hoped. Vaccine is in all hands, vaccination is, with the aid of governments, spreading continually. In the same direction Pasteur worked resolutely, even with boldness; he introduced into practice the vaccines of chicken-cholera, anthrax, and rabies. Others have followed him, and the new doctrine of antitoxins is continually acquiring more adherents. But it has not yet emerged from the conflict of opinions. Still less is the secret of immunity itself revealed. Even if everything points to the view that immunity is based on the condition of the cells and the juices of their parenchyma, and not on the serum or the humors—these being probably only the means of transport for the immunizing as for the infecting fluids—we must still become well accustomed to the thought that only the next century can bring perfect light and certainty on those points. The homeopathic notion that toxin and antitoxin are one and the same, seems so foreign to our biological idea that very many experimental and practical proofs will be required before it can be admitted into the creed of the future. Before then we must at least have

succeeded in finding a way of strengthening the cells in their fight with bacteria by means of immunity.

Let us, in conclusion, turn once more to the s ecial cells which build up the body, and which arise from proliferation within the body. These exhibit numerous analogies with microbes. They also are independent living beings, or, as Brucke said, elemental organisms implanted in the social structure of the body. They can be removed, transplanted, and grafted in a new situation. If they increase, and thus form a tumor, this can produce metastases by transplantation. But the process as such is always bound up with a certain number of living elements, is always cellular in character. It is not the flowing blood which makes a tumor or a cell; it is the mother cells, from which all new formation originates.

From this consideration I have for decades drawn the conclusion that the local action of the cells, bound up as it is with certain matricial parts, dominates pathological laws, and must also determine the practice of physicians and surgeons. Cellular pathology demands above all treatment attacking the effected parts themselves, be this treatment medical or surgical. It is with great joy that I see this deduction ever becoming more widely generalized, be it with more or with less conscious knowledge. Hence follows in surgery the recommendation of early operation or destruction of the focus of disease.

But cells also, just as bacteria, exercise chemical influences. Apart from the destruction which they effect by absorption, they secrete chemical substances. These appear first as tissue-fluids, passing later into the circulation. Thus arises a change in the composition of the flowing juices, particularly of the blood, in fact a dyscrasia. This is, as I have always explained, a secondary dyscrasia, quite distinct from the primary dyscrasias of the humoral pathologists, by localization of which topical disease, and particularly tumors, were supposed to arise. According to my view, each dyscrasia is determined by the taking in of products of tissue-secretion which may now be called metabolic products, or according to the old dictum, recrementitious substances. The tissue-juice and the excreted material which is returned into the body have of late years gained much esteem. The semen, which I myself have always indicated as the classical example of such a tissue-juice, and exhibited as the prototype of secretion by tumors and organ-cells, has provided materia medica with spermin, as has the thyroid juice with thyroidin and thyroiodin. New substances, some resembling alkaloids, others albuminates, are isolated from various organs, experimentally tested, and technically worked up. So arose injection or serum-therapeutics, on the results of which we are not yet in a position to

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pass a final judgment, though every one who is sufficiently unprejudiced must admit that they have in many cases been good. Experience will determine the value of these methods; you must learn by the aid of practice to deduce the lasting theoretical truths. But never forget that the source of all these substances and secretions is the cell-activity of living tissue, and that its therapeutical or pathological action on the individual organs or tissues can thus accomplish no aim beyond that of exercising a regulatory influence on cell-activity. May the medical school of Charing Cross Hospital continue upon the newly opened path with zeal and good fortune. But may its students at the same time never forget that neither the physican nor the naturalist dares dispense with a cool head and a calm spirit, with practical observation and critical judgment.—*American Medico-Surgical Bulletin.*

De Vlaccos (*Ann. de Gynec. et d'Obstet.*) gives a full report of a distinct instance of precocious puberty, with a photogravure of the patient. She was born in August, 1892, and has all the appearance of a child of ten years, excepting that as far as the genital and mammary regions are concerned she is yet more developed. In height she measures 3 feet 8 inches; her weight is 3 stones 8 pounds. The hair of her head is very abundant, whilst her intellectual development is not above her years. When six months old a bloody discharge was noticed, and it returned in about six weeks. The interval steadily became shorter, and now the catamenia are monthly, lasting for about four days, the child becoming depressed in spirits at each period. The mammæ resemble those of a girl of seventeen years, and not only has hair grown on the pudenda, but much subcutaneous fat has developed in the region of the thighs and nates, as normally occurs at puberty.

SOME PECULIARITIES OF DOCTORS.

Doctors are in some respects very incomprehensible people. They are over-sensitive, and prone to misunderstand the motives of others. They do and say things which other people would not do or say. Many things which others think proper they think improper. This is especially true in business matters. The training of a physician is very different from that of an ordinary business man. He spends years in college and a professional school, and when he gets into active practice he still lives in a world of thought, while the business man lives in a world of practical activity. Two men who were bosom friends as boys and who have become, one a physician and the other a business man, find when they are forty that they are in many ways strangers to each other. Their time has been spent in such different ways that they have grown apart, and in many things do not understand each other. While the one in his quiet study was acquainting himself with the ideas and actions of men who have been dead perhaps for centuries, the world has, so to speak, passed along with a clatter and strife which he quite likely comes to despise. His companion, on the other hand, has entered the rushing throng and struggles to keep his place in its onward march. One becomes a man of thought—the other a man of action. Just in proportion as each has devoted himself exclusively to his own line of work, he becomes incapable of sympathizing with his friend or even understanding him. The doctor seems to his friend to become "funny," then "rather queer," and at last "decidedly foolish;" while the business man who was perhaps in boyhood the soul of integrity, seems to the doctor, who does not understand modern methods of business or even the fundamental principles on which alone a successful career can be built, to have lost much of the sense of honor. So they continue to grow apart except as the requirements of business or social intercourse bring them together and enable them to see why the other thinks and acts as he does.

Too often the doctor's intercourse with business men is too limited to enable him ever to understand them, and he continues through life to hold his "queer" ideas of business. If he has on hand a matter of business so simple that a common office boy would know just what to do, he feels obliged often to seek advice before undertaking it, but too frequently he thinks this would be humiliating or assumes that he knows enough to get on without advice, or that men in doing business with him will think of his advantage and profit as well as their own. Usually this ends in trouble or loss of some kind and sometimes in annoying lawsuits. A doctor is not as likely to be aroused by such an experience to acquaint himself with

business methods as he is to become embittered against business and business men, and to think they all lack honor and honesty.

Doctors also show how different they are from other men in that the plain statement of these facts will often call forth keen resentment from many of them. Possibly that will be the effect of this editorial. Lawyers will oppose each other in court with all their might and apparently with great bitterness, and yet in a few minutes be seen on the street chatting together on the best of terms. Clergymen are like doctors in this respect, and with them form one extreme as lawyers form the other. The difference between them is this: Lawyers distinguish between *personality* and *opinion;* clergymen and doctors do not, as a rule. The lawyers are right. You doubtless have friends who hold views radically different from yours in some respects and yet you remain firm friends. If you ever criticise each other you do it without any idea that the other is unworthy of your respect and friendship. You distinguish in that one instance between *personality* and *opinion*. You differ with your friend's *opinion* and criticise it, but respect his *personality*. You see that it is possible for him to be wrong in his *opinion*, while remaining noble and true in character.

Every one has friends whom he treats in this way, but the fact is, the number of subjects on which clergymen and doctors will allow others to differ with them, while still counting them friends and retaining respect for them, is comparatively small. With business men the number of such subjects is much larger, and with lawyers greater than any other class. The matter resolves itself into the degree of *tolerance* for the opinion of others. The clergy was the most intolerant class in the community in the middle ages, as the tortures of the inquisitions and burnings at the stake testify. Probably they hold that place to-day, but doctors as a class are nearer to them than they are to business men or lawyers. The training which each class receives determines its characteristics. It is not a question of men, but of the effect of training and environment long continued, as pointed out above. Very likely your studies have made you a firm believer in the doctrine of evolution, that "function determines development;" if so, you will readily see why these classes differ in this way. The clergyman studies *absolute right*, and tries to measure all human action by that standard, and becomes an uncompromising foe of everything that differs with it. He may meet a good many men, but he sees as a rule only their Sunday clothes and their Sunday thoughts; he sees the best side of their natures. Lawyers, on the other hand, see the worst side of men; they become acquainted with the different ideas of right that prevail in different nations and even among different classes in the same

community, and find that men, noble men, honestly hold opinions which are directly antagonistic, and so lawyers come quite naturally to distinguish between persons and opinions more fully than any other class.

It is because we firmly believe that doctors can command the respect of communities in which they live, especially of business men, to a far greater extent than they do at present, that we speak thus strongly. Doctors, as a rule, are exceedingly good fellows, and we would be the last to point out their shortcomings, except in a friendly spirit. They occupy positions of prominence in their communities, and so every little foible which they may possess will be the more conspicuous.

Perhaps their peculiarities are most noticeable in business matters. As a rule their business transactions are limited to collecting bills and buying the supplies which their families require. In the latter they are often as successful as other men, because their experience usually begins as early in life. But in collecting doctors sometimes exhibit an amazing ignorance of human nature. Young graduates often think all they have to do to get ahead in life is to attend a few "cases," have some bills printed from a steel plate on nice paper, and when they want money fill one of the blanks and send it to a patient and wait for the next return mail to bring them a check. This delusion does not last long. Other physicians, whose years of experience should have taught them wisdom, never send bills till they need the money. If they happen to want one hundred dollars they will look over their books and find some one who owes them about that and send a bill. They never send bills to patients who are "good" until they actually need money, and then are surprised to find some have moved away, some forgotten that they were ever treated at all, and others inclined to claim that the bill was paid "long ago," because it is so old and "gray-haired," and it is not their custom to allow bills to remain unpaid so long. As a result the doctor finds that he is lucky if he can collect 25 per cent. or perhaps even 10 per cent. of the amount on his ledger. To some extent the public is to blame for this, but it will do little good to discuss that point here, as few laymen will see this article. Doctors could themselves, however, obtain very much better results if they would study the methods of collecting. It is not a difficult question to master. For a doctor to be as ignorant of collecting as his collector is of obstetrics is a disgrace. No matter how careful a surgeon is to boil his instruments, to use only distilled water and have everything about the operating room antiseptic, if he forgets to wash his hands or leaves any one of the steps even "half done" his work is not perfect. In the same way it may be said that however successful as a practitioner a doctor may be, if he fails to collect enough from his practice to pay his honorable debts he is nevertheless some-

thing of a failure as a *man* and *citizen*. Doctors deal with their fellow-men at two points—the sick bed and the cashier's desk. If they are "slow" at the latter point people will say it is because they are "slow" in the other; whereas the fact is more likely to be that they believe in the Golden Rule themselves and think their patients are living in accordance with its precept, and will be only too glad to pay their doctor's bill the moment he gives them a chance. Such faith in the good intentions of humanity would be sublime if it were only well-founded. But it does not require a long experience in business to discover that while most men consider the highest rule of life to be "Do unto others as ye would that they should do unto you," they are living in accordance with the vulgar revision of that rule, "Do others before they do you." We do not mean by this that most men are dishonest, but simply that the customs of business have not as yet been evolved as far from primeval crudeness as our ethical precepts. Office boys learn business customs through the week and ethical principles on Sunday, and when in later years they are looked up to through the week as "very successful" and on Sunday as "very pious," they may not be conscious of this great discrepancy between their practices and their professions.

Some doctors work for fame; they want to be known in their localities as the most successful surgeons, or general practitioners, or specialists in some particular line; but most doctors are practicing to make a living. It would be well, therefore, if they could bring themselves to feel that no case should be considered as "successfully treated" until they have collected the bill or remitted it for charity's sake. To them collecting is a very vital point of practicing. It would be well if medical schools gave a few lectures on this subject and spared young doctors their costly experience.

Business men usually send a bill with goods when they are delivered or soon after, and a statement of account on the first of the following month and each month thereafter until the bill is paid. They expect to receive bills for what they owe in the same way. It is romantic nonsense for doctors to suppose that intelligent people will be offended if they send a bill within a year. You will no doubt find exceptions, but can you afford to sacrifice one-quarter or one-half of what you can collect by acting promptly like a business man, for the sake of the good will of such unreasonable persons? The doctor who arrives at a general conclusion that because exceptional individuals are offended by bills within a year, all his patients will be, is very illogical. His mind would not act so in professional matters. He would not say that because one man swallowed a fish-bone "without hearing from it," all men could do the same. You can not escape the criticism of cranks, if you try. Wait a year and some will forget how serious

their illness was and so will refuse to settle unless the bill is reduced; send your bill while the patient is still pale and keenly conscious of the seriousness of his sickness and you will be criticised for not giving for him more time to "get on his feet again" in business. You must steer between Scylla and Charybdis. Many doctors think that by sending bills soon after patients recover they will give offense and cause them to select another physician the next time they are ill. But is it not equally true that if you wait long before sending bills you will find that some men by reverses of fortune or lack of thrift have become unable to pay their bills and are so ashamed of themselves for allowing them to remain unpaid that they will seek medical advice elsewhere? It is better to lose the former patient than the latter. We once knew a doctor who never allowed an account to remain long unsettled. If he found a patient too poor to pay a remunerative fee he scaled his bill down to meet the patient's ability. Sometimes he donated his services, but he saw to it that in some way every bill was settled. The consequence was that while he had the reputation of being a close financier, he drove the best and fastest horses, had the best carriages, lived in a large house with fine grounds and had more friends than any other man in the community. Every one knew that he could command the doctor's services and also that he would have to pay him according to his ability—a good fee if he was well off and nothing at all if he were very poor. That doctor left a snug fortune when he died. It would be well for the profession if more doctors would follow his example. Perhaps it would prove a good thing for the doctors in each community to combine and adopt a uniform system of collecting and barring the chronic deadbeats from getting any treatment until they deal fairly with physicians. Certainly it would be a good thing for the reputations, practice and bank accounts of the doctors themselves if they could succeed in conducting their business affairs more nearly as business men do.

We speak strongly on this subject because we think it is of vital importance in the success of every practitioner. We should be very glad to publish the views of any doctors who differ with us or the experiences of any who have discovered successful ways of collecting. If requested we would withhold the names of correspondents.

GONORRHEA IN WOMEN.*

BY DR. JOSEPH RILUS EASTMAN, INDIANAPOLIS.

There is no malady to which womankind is liable that should engage more consideration than gonorrhea. Strewn in the train of its ubiquitous and wily germ are pathologic ravages of surpassing import in their clinical and moral consequences, yet hardly recognized or understood. Sinclair observed a decade ago strange indifference toward differential diagnosis of gonorrhea in the female, and even now, when in the light of recent bacteriology, it is easily possible to demonstrate the gonococcus in the act of pathologic mischief, there exists a notable, if not notorious, tendency on the part of most general practitioners, and some specialists, to disregard in doubtful cases discriminating diagnosis.

The diagnosis of acute gonorrhea in women is comparatively easy, even without the microscope. What with a history of impure coitus, free purulent secretion from vulva, vagina, and urethra, intertrigo, burning on micturition, and vesical tenesmus, the diagnosis is not far to seek. Upon inspection one usually detects a discharge of tenacious pus; or greenish or yellowish streaks upon the linen may alone be in evidence. Erosion may be present upon the skin, upon the labia majora, or in the inguinal or gluteal folds. The labia minora, the clitoris and its prepuce and the hymen if present, are red and swollen. The meatus urinarius is found to be congested and ectropic, its normal pink color changed to a deep red. The mouths of the ducts of the Bartholinian vulvo-vaginal glands are deeper in color, gaping and tender. They discharge, instead of their normal glycerine-like secretion, pus laden mucous. A small area of mucosa immediately about these openings, exhibits a purplish red nuance. The surface of the vagina proper presents no great changes, the adult vaginal mucosa being practically uninfluenced by the presence of the gonococcus; not for the reason generally presented, namely, that the germ can not exist upon flat epithelium, but more probably because (as Doederlein has pointed out) of an acid environment and the presence of the vaginal bacillus.

It is certain beyond cavil that the gonococcus can grew fat upon flat epithelium. Rosinski reported five cases of gonorrhea of the mucous membrane of the mouth of the new born; and specific vaginitis in children is by no means rare. It occurs so often in plural instances among the children of the same household in Germany, that the term "gluckliche familie" has obtained general currency as a technical expression

*An abstract of paper read at the Mississippi Valley Medical Association, Nashville, October, 1898.

of the craft. The so-called "happy family" is one which father, mother and all of the children are simultaneously ill with clap.

A comprehensive examination of the discharge is not complete until the secretions of the urethra, Skene's lucunæ, the glands of Bartholini, the vagina and cervix, have been searched through; and in chronic cases several preparations should be made from each of these.

Before each act of removing discharge for examination, the vulva and the vestibule should be rinsed with warm, sterile water, and dried with cotton pledgets. The secretions of the urethral mucosa, this being the germ's favorite habitat, is generally sought first. The universal method of securing it is by milking the tract with the finger in the vagina, stroking it gently from the vesical opening to the orificum externum. If specific urethritis without discharge be present, nitrate of silver willgenerally bring the diplococci from the deeper layers. The urethra being emptied, any secretion present in Skene's glands may be evacuated by stroking with two fingers astraddle the urethra. The vulvo-vaginal glands will evacuate their discharge if compressed between the thumb and fore-finger.

To secure unmixed gonorrheal pus from the cervix uteri, care should be taken that the platinum wire does not come into contact with vagina or portic. It is best to first rinse, and then dry the vagina with cotton to free it of mucous.

It is not to be assumed that because the bacteria are intracellular that they are therefore gonococci; for it is certain that other diplococci than those of gonorrhea lie within the cell protoplasm. Moreover, the writer has seen preparations in which the unmistakable gonococci lay altogether without the cells.

The most distinguishing characteristic of the gonococcus as stained by the Pick method, according to Broese and Schillar, are the deep blue color, the biscuit or coffee-bean form, and their superior size. The gonococcus is an exceedingly large diploccoccus, averaging one and one-half micro-milimeters in length and three-fourths micro-milimeters in breadth.

It will be concluded after many examinations for gonococci that the urethra is the predilection seat of gonorrhea in women, and that the vulvitis and vaginitis are secondary, being caused by the bathing of these parts with the discharge from the urethra and cervix. Vaginitis and vulvitis are rarely seen in cleanly women, accoring to Bumm.

In many cases of endo-cervicitis, endo-metritis and salpingitis gonorrhea, it is impossible to isolate the specific germ.

A classical, clinical picture of gonorrhea is complete, and yet the most skillful attempts to run down the gonococcus are futile.

An adequate explanation of this paradox has been given us by Wasserman. He has shown that the gonococcus produces an active, specific poison. The poison is contained within the substance of the gonococcus itself. The poison remains active after the death of the germ. A very small amount of this poison if injected under the skin produces inflammation at the point of application, fever, swelling of the neighboring lymphatic glands and pain in the muscles and joints. Wasserman sought to find whether there is any immunity against this poison, with a negative result.

With these facts in mind, many dark places in the symptomatology of gonorrhea become more clear. It is possible to explain, by this token, blenorrhagic rheumatism after the gonococci have entirely disappeared. Moreover, the peculiar symptomatology of chronic gonorrheal inflammatian of the female genital apparatus becomes clearer.

Remembering that the gonococcus is ærobic and does not multiply under exclusion of oxygen, on the other hand very soon dies under this condition, the picture becomes still clearer. The cocci may become incapsulated and cut off from the circulation in an old exudate and die off, but at their death and disintegration the inflammation and fever-producing germs are set free. If they are absorbed, fever results; if they remain localized the local inflammatory process continues, perhaps indefinitely, since the organism can not immunize itself.

We have seen that the diagnosis of acute gonorrhea may be made by contemplation of the clinical phenomena alone; for example, if accute urethritis be present, we are almost certain that the gonococcus is to blame. A few day's observation will establish the diagnosis beyond conjecture, since the symptoms of non-specific urethritis will disappear rapidly. In chronic gonorrhea, however, too much dependence upon clinical manifestation is hazardous.

Condylomata are often present, but appear also often independently of gonorrhea. Debris-laden discharge from the vulvo-vaginal glands is usually an expression of old gonorrhea, but other germs, as the staphlococcus aureus and saprophitic forms, may occasion just such discharge. Among the more common indications of chronic gonorrhea are the maculæ gonorrhoicæ of Sanger, red papules about the openings of the vulvo-vaginal glands, sclerotic inflammation of these glands, in which the glands are felt as hard non-sensitive nodules under the examining finger, cysts of these glands and scars and erosions in the vulva. To these may be added the colpitis maculosa and granulosis.

All of these conditions may be caused by other germs than gonococci. Here, as in acute gonorrhea, the most reliable indication is the urethritis.—*Columbus Medical Journal.*

THE COUNTRY DOCTOR AND ASEPTIC SURGERY.*

BY P. A. WALLING, M.D., PARK RAPIDS, MINN.

That surgery has in the last decade made great strides toward perfection perhaps none realize more than the thinking country physician. That many diagnoses are made with clearness and precision which were only a few years ago obscure or doubtful is perhaps better appreciated by the city or hospital practitioner, but it is also realized fully by the alert country doctor.

Within the memory of my practice, all abdominal inflammations that were characterized by the usual sudden onset, pain, high temperature and tympanites were grouped together as one disease, and disposed of, generally by the undertaker, as "inflammation of the bowels." The abdominal cavity must under no circumstances be opened, and if by any accident the bowel was perforated, and the contents however small escaped, the case was considered as hopeless as though the heart had been punctured or the meninges exposed to the air.

To the city hospital surgeon all this has been changed; with modern knowledge of cleanliness, for which asepsis is but another term, the abdomen may be opened with as much impunity as a felon may be lanced; tumors and other morbid or septic material may be removed from the brain or spinal cord, and even the deeper recesses of the nerve centers may be exposed, and a recovery so far from being doubtful may be confidently expected.

Rules for asepsis, rules for disinfection, rules for this and rules for that are published without stint and almost without number, and it seems as though a wayfaring man though a fool could not err therein. This last expression is from the Holy Scriptures, and that is perhaps what makes it sound so new to most of you, and it makes me think of one more circumstance also from the same book, and that is what Haman remarked. After he had been honored far above everybody else and above what he deserved, he said: "All this availeth me nothing so long as I see Mordecai the Jew sitting at the king's gate."

I only change that to read: "All these rules and directions for asepsis and preparation avail me nothing when I am called to make a hurried operation that will not admit of a moment's delay and see a bedbug roosting on the head of the bed."

All these rules for asepsis, directions for cleaning the hands, washing the parts and getting ready for an operation are all right and as necessary to the success of an operation as can well be imagined, but I trow very few of those who insist on thorough asepsis realize, if they know, what the average frontier practitioner has to contend with.

*Read in the Section of Surgery of the Minnesota State Medical Society, June 16, 1898.

It is the object of this very imperfect paper to note some of the points where we succeed without any preparation and where a typical city man would fail.

I will try in the first place to draw a pen picture of an average frontier country home: The house is usually built of logs without a foundation and covered with boards, shingles or shakes. The walls are unplastered and usually covered with bedding or newspapers and are absolutely unclean, generally filled with dust and garrisoned by cimex lectularius or pulex irritans, which Conkey defines as two too well-known insects. Floors are of loose boards and above all are generally open, while the lower floor is usually lined with paper to keep out the cold, and this paper is often saturated with water from a dirty mop or, worse, with the excretions of children who are often untaught in the ways of civilized decency. Personally the people correspond with their surroundings. Their washing is done carelessly, often without boiling; bodies are unbathed except perhaps the male members bathe during the log driving season, the same as a pioneer Western man dies with his boots on; dogs and cats lie under or upon the bed, and fleas, et cetera, are a seemingly large part of the population.

Absolute ignorance of the simplest sanitary principles and seeming inability to comprehend what cleanliness is render requests for clean water and clean towels inert. In asking for the foregoing articles I have had a wash dish brought to me with a rim of dirt at the water line, two or three rags drawn in at the bottom and a towel at the sight of which a printer would die of envy. These people are poor; they are not really to blame for this condition, for they are driven to seek the barest necessities of life in the Northwestern wilds, and were long since obliged to be satisfied with what in its simplest form would support life.

This class of people have many accidents and raise many children; they are frequently ten to thirty miles from any place where cleanliness is at all observed, and if not so it is often an impossibility to have them removed at all.

I will give you one instance of surgery under almost the identical circumstances enumerated above.

A young man was driving a log measuring about 500 feet through the woods one afternoon, when he being on the load, it tipped, throwing him to the ground and pinning one leg between the log and the binding pole on the hard frozen ground. He was picked up and taken to the house, where I found him a little after dark, lying on the floor, with a compound fracture of both bones just above the ankle joint.

A small kerosene lamp afforded all the light, and an examination revealed a very serious condition under any circumstances and made infinitely more so by the surroundings.

Should I amputate? seemed the only question, and had I been ready I believe that leg would have gone to the bone.

yard before morning. I was not prepared without going eight miles for help and more instruments, and so decided to try to save it. I asked for cloth for bandage and was supplied with those which your dry goods men here in the city would hate to own once belonged to them.

I had plenty of carbolic acid and bichloride of mercury and made appropriate solutions of each and drew that leg into position and dressed it in a fracture box and bandages with a liberal supply of both antiseptics, and left him late at night comparatively easy.

Do not ask me if any pus accumulated in this wound or I shall be obliged to lower my dignity and descend to slang. I visited that case every other day for about four weeks, not trusting any one else to dress it, and often found puddles of pus an inch in depth alongside of the wound. At each visit I dressed and cleaned it up, taking my own bandages after the first visit, and had the satisfaction of saving the foot, and though it is united in rather bad shape, he walks about as well as ever. With the five dollars and the chicken I received for this work, I made a meal and with the balance bought more antiseptics for the next case.

In such cases as these, so far removed and under such circumstances, cleanliness is not to be considered; for if you touch anything you only raise a dust and bring it, if possible, into more septic conditions. Do not clean the dirt from under your finger nails, but cover it down with a little oil; do not wash your hands, for they are no doubt dirty enough now; do not scrub down the walls or the floor, for if you let the denizens of this territory alone they will come nearer letting you alone.

When we studied medicine Dr. Julius F. Miner told us the first surgeons were not those who could make a successful job when they had all the modern applicances and surroundings, but the man who, when far away from patent splints, could with his jackknife and a fence rail make the apparatus that would properly secure a fracture.

A man to practice surgery in the country may. if he likes, learn all there is of modern methods and all the details of asepsis; but if he thinks he must have all these things at hand for every case he will oftener find he is without resources than otherwise. I do not wish to be understood as ridiculing modern asepsis or modern methods. On the other hand, I consider the advance of the last ten years as wonderful beyond comparison, and the good it has accomplished and lives it has saved will never be known; but what I wish to say to the country practitioner is, because you can not have and use all the modern improvements do not be discouraged, but do the best possible under the circumstances, and if you succeed, well; if you do not, the fau t lies not with you.—*Northwestern Lancet.*

WHEN, AND WHEN NOT, TO INTERFERE.

The normal, that is the usual, position of the uterus causing no discomfort is in the axis of the pelvic inlet, and at an angle to that of the vagina, which may, roughly, be said to lie in the axis of the pelvic outlet. When the uterus is tilted back, it is said to be retroverted, and if bent back, retroflexed. Forward displacements are anteversions and flexions. It is a common custom to replace organs thus dislocated from the common position and hold them thus by means of mechanical appliances, pessaries, whether the malposition is causing any trouble or not. This is a mistake. So it is to stitch up a torn cervix and a lacerated perineum that is causing no trouble. Countless numbers of women have enjoyed perfect comfort despite versions, flexions and lacerations, who were first initiated into the mysteries of chronic genital disturbances after the wanton interference of an officious medical attendant.

"Meddlesome midwifery" is an expressive term born of the home-driven conviction caused by long experience, that the normal course of affairs is often wantonly interfered with to the detriment of the patient. Children's lives are offered up constantly as unnecessary sacrifices to this moloch of useless, nay harmful, interference. Food is changed, clothing is altered, and strong medicines needlessly given, for the mere sake of doing something. The child suffers—the physician ought.

We may safely lay down the rule that when an abnormal condition, in itself not necessarily dangerous or bad, causes no disturbance, it would best be left alone. We have known of a perineal laceration that never caused the slightest discomfort in an active woman during eighteen years, and despite which all the pelvic organs remained in their proper positions. If this is possible in one case, it may be so in others; and what is true of so signal a disturbance of local relations as a torn perineum is more apt to be true of lesser troubles.

Meddlesomeness is the crime of carelessness and ignorance. We should not disturb the harmony of the bodily functions by wanton interference. Too often, the penalty is severe. There is much to lose and nothing immediate to gain. The fact must be ever borne in mind, that in such cases of needless interference, the patient submits to an unknown treatment or operation because of confidence in the judgment and honesty of her adviser. Under the most favorable circumstances, she can feel no better than she did before treatment began, for she felt perfectly well then. Should she feel in any way worse, she is justified in questioning the physician's skill, judgment and honesty.

Many a child's life has been the cost of needless interference during birth; the mother is often injured; and, worst of all,

the offender seldom recognizes his error and thus continues his damaging course.

It has often been said that most of the art of medical practice lies in the making of a correct diagnosis, and this is undoubtedly true, for treatment is usually easy enough when a correct and thorough diagnosis has been made. At all events, it enables one to say whether treatment is likely to be of much account or not, or whether really needed or not. And right here is the point we contend for—whether really needed or not. How many men ask themselves this question? Very few. The placebo should be used much oftener than it is. Christian scientists and faith curists, and faddists generally, cure when there is little or no trouble, unless it be such as can be favorably modified by mental suggestion. But a suggestion clothed in some form that may be harmful in itself is bad, should never be used. Operations and potent drugs are bad media for the conveyance of suggestions. This should be distinctly remembered. The tendency to rush from one extreme to the other is so great that fads are the inevitable outcome. It has been so from the most remote times, and is so at the present day, more noticeable now because of the increased diversity of our knowledge, and the consequent greater scope offered for the indulgence of our varied enthusiastic fancies. Common sense, good, staid, unruffable reason, are more needed now in medical practice than ever before. Fads come and go, like the leaves of the trees and the broods of the lesser organisms, but rock-ribbed truth is everlasting. It has a quality that the balanced mind readily detects it by, but which the enthusiast fails to see.

The lesson we would draw from all this is not to repair a past injury that nature has cured in her own way, and which causes no trouble. Also not to wantonly interfere with a patient's food and environment to which she has adapted herself, nor to interfere with the processes of nature when they are normal, or even when abnormal if they are subserving a useful purpose and tending to a desirable end. It is better to use a placebo when in doubt, and suggest to the mind of the patient an abundance of hope, than it is to employ potent remedies, for there is danger that they may be misemployed.

Whilst these are all admittedly trite enough truisms, the other fact remains with distressing clearness, that those truths are not put enough into practice, and that all suffer in consequence—the physician and the general public and the medical profession. Why not come down off our high horses, and first of all do that which we know to be good, then leave undone that which we know may be bad, and finally cheer our patients when we know that we honestly can, and when it will do them good?—*The Medical Council.*

ADDRESS IN SURGERY.*

BY W. L. ESTES, M.D., OF SOUTH BETHLEHEM, PA.

"Surgery has reached its zenith, and no advances of any value or magnitude may be expected in the future." This remark, said to have been made by a distinguished English surgeon some ten years ago, seems ludicrous indeed in reviewing the work done in surgery during the last year alone. This work is so considerable that I shall not, in the short time allotted to this address, attempt to give more than a sketch of a part of it, and then draw some conclusions which I trust may receive the endorsement of this society, the members of which are known to be thoughtful students of medical progress, and are accustomed to note the trend of scientific endeavors.

The brilliant operation of Schlatter, of Zurich, in successfully removing the whole stomach from a human being, stands perhaps foremost amongst the achievements of the year. As an exhibition of perfection in surgical technique, it is remarkable even in this day of asepsis; as a contribution to the physiology of digestion, it is even more valuable, however. While I do not believe it should set aside conclusively many deductions founded upon Dr. Beaumont's classicol experiments on the healthy stomach of Alexis St. Martin, it gives us most important suggestions with reference to the proper status of the stomach, and the unthought-of possibilities of intestinal digestion. The vicarious intestinal assumption of gastric function in Dr. Schlatter's patient was reached only after a long and very gradual process, as the history of the case shows.† The stomach of the old woman had, at the time of operation, been reduced to a small cavity with thick, indurated walls; every vestige of glandular tissue was choked by the cancer, so that its sole function at the time of operation and probably for some time previously, had been simply to serve as an imperfect passageway for the food into the intestines. What little digestion had been possible was done by the intestines; the stomach was not only the seat of the poison producing neoplasm, but was entirely cut out of the physiology of digestion.

Surgeons who wish to repeat Schlatter's operation should bear this in mind. They ought also to remember that Schlatter's case was unique in that while the whole stomach was involved, the neighboring glands and omentum were not implicated, and the stomach was still freely movable and unattached by adhesions. To find these conditions combined in the same patient must be exceedingly rare.

Another notable instance of ablation and the marvelous

*Read before the Pennsylvania Medical Society, May 18, 1898.

†See Medical Review, Dec 25, 1898.

adaptability of the gastro-intestinal tract was the case of Shepherd.* In extirpating a thirteen-pound fibromyoma of the mesentery, Shepherd was obliged by dense adhesions to remove seven feet eight inches of the small intestine of a man, who not only made a prompt recovery, but rapidly gained in weight afterwards.

Equally remarkable was the operation of Mr. Frederick Treves† in removing the whole descending colon and rectum from a child who had idiopathic dilatation of the colon. Colotomy having failed to relieve the child, about eight months after this operation Mr. Treves did the second operation, which consisted in exsecting the whole colon from its flexure in the left hypochondrium, and the rectum, and then bringing the end of the transverse colon down to the anus and suturing it there. The result was a complete relief of all the symptoms, and a happy recovery of the child.

Hepatic and renal surgery have had a great impetus during the last year. Mayo Robson, in England, Lange, Senn, Halsted, Murphy, and Fenger, in this country, have done excellent work in cholelithiasis; while the labors of Kelly, Weir, Fenger, Gerster and others have done much in advancing the technique of renal surgery. The impetus given by Kelly in this country, and by Pawlik on the continent, to ureteral catheterization, has led to routine examination of kidneys and ureters separately, and has made it possible to diagnose so surely that many brilliant operations on the ureters and kidneys have been performed. The future promises much for this line of work, and this will result in saving many kidneys and lives.

Besides this most excellent work Kelly has inaugurated, with the help of Noble, and a few other conservative men, an era of conservatism in gynæcology. These surgeons now enucleate uterine fibroids or myomata, without extirpating the organ itself; they recommend the enucleation of tumors of the broad ligament, without sacrificing the ovaries, and even treating puerperal septic metritis without sacrificing the uterus in many cases.

Kelly's demonstration of the possibility of the air-distension method for cystoscopic examinations of the bladders of men is also of great importance.

Dr. J. B. Murphy has shown that it is quite possible to unite divided blood vessels, and to repair torn vessels without obliterating their lumen or interrupting permanently the flow of blood through them, and he has thus made it possible to preserve important organs or members in case of accidental injury to their principal vessels.

The employment of skiagraphy, which promised much, has

*Montreal Medical Journal, December, 1897.
†Lancet, Jan. 29, 1898.

been shown to be of limited application, and while most useful in a restricted employment, the variability of tubes and currents, to say nothing of the plates used, make it very difficult to lay down any very helpful and certain rules for the general use of the X-rays. Besides, the very disagreeable burns which have resulted from too long exposures indicate that photographic investigations ought, in their mechanical parts, to be entrusted to a limited number of experts, with fixed, properly tested, and well-known apparatus. The fluoroscope, however, is a most valuable agent in employing X-rays, and even to unskillful operators, with a little practice, it will render fruitful results.

The addition of formaldehyde to the sterilizing armamentarium has proved a valuable acquisition. For sterilizing knives and edged instruments generally (by its vapor), it seems almost an ideal agent; and it will perhaps soon divide honors with dry heat and steam for the sterilization of dressings.

The recrudescence of the very important discussion of how best to sterilize and prepare the hands for aseptic operations has resulted in the adoption very generally of some form of glove. The ideal glove material has yet to be discovered, but thin rubber gloves seem to have the best endorsement at present.

Schleich's general anæsthetic mixture, which at first seemed to promise much, has not received the hearty endorsement of American surgeons. In an experience of thirty-eight cases, the writer has found that while anæsthesia is easier as a rule, and cyanosis is not as common as with ether, vomiting, especially late vomiting, is just as common and more distressing. Dr. Willy Meyer, in a recent letter published in the *Medical Record* (*Medical Record*, April 22, 1898), called attention to some investigations made by Dr. Weidig at his (Dr. Meyer's) suggestion, which showed that the ordinary Schleich's mixtures are really mixtures, and not genuine solutions. The chloroform, petrolic ether, and sulphuric ether partly combine; no free chloroform could be found, but in each of the three solutions free sulphuric ether in varying proportions was found. Dr. Meyer also mentions the fact that Meltzer, who investigated the physiological effect of pure petrolic ether for him, found that it acts as a tetanizing agent on animals. It may prove not to be the innocent diluent that Schleich believed it was. The mixture should therefore be used with great caution.

Traumatic surgery has received scant consideration during the last year; indeed for many years surgical investigations have been confined almost wholly to pathologic surgery. The distinctions between "general surgery" and "gynecologic surgery" will possibly soon disappear, and the two be merged,

but there is gradually developing another special branch of surgery, which may be called traumatic surgery. In times of peace this specialty will belong chiefly to surgeons connected with railway, mine, and mill hospitals. It is a great pity that this class of surgeons, on account of excessive work and modesty, has not given the profession the product of its labors and experience in well-considered, systematic, and comprehensive monographs. The present "little unpleasantness" with Spain may serve to give a fresh impetus to acute surgery, and in the next few years traumatic surgery may again rank amongst the foremost endeavors of our progressive age.

It is a great mistake to believe that the "last word has been said" in traumatic surgery. Antisepsis and asepsis have done marvels for conservative attempts, and in lowering the general death rate after injuries. Of very great importance, in this branch of surgery, is the fact that acute anæmia is the dominant factor in ordinary surgical shocks. The writer, in urging this doctrine about ten years ago, gave certain comparative statistics from his own work to emphasize his point. In 1894 in a monograph entitled "A Contribution to the Study of Modern Amputations,"* this doctrine was again brought forward, and it was shown that by practice founded upon it, the mortality rate in a series of 180 single major amputations (which included seven hip-joint amputations, with only one death) was reduced to 2.77 per cent. against his former rate of 7.89 per cent. in 114 cases; the double synchronous amputations in 25 cases was reduced to 12 per cent. mortality, against 46.25 per cent. in 13 cases, after the old practice. Since the publication of the foregoing statistics, there have been 84 single major amputations and 2 deaths, a mortality rate of 2.38 per cent., and 17 multiple amputations and 2 deaths—11.7 per cent. mortality. In writing some years ago on the mortality rate of modern amputations, the writer stated that he believed the results after single major amputations ought to be as good as those after the average ovariotomy operations. It seems he has now the satisfaction of having realized this anticipation. The argument for the method—if one can call it a method—is, as observation shows, that by far the majority of deaths after modern amputations occur within forty-eight hours after operation, from exhaustion or shock, and as this so-called shock is a condition brought about by acute anæmia (great loss of blood), it is bad surgery to operate upon a person reduced almost to a moribund condition, when by careful antisepsis and the employment of elastic constriction over the crushed tissues, no evil is likely to result for thirty or forty hours, and during this time by the employment of active stimulation with strychnine and saline enemata

*Medical Record, Nov. 3, 1894.

the patient may again have his vessels filled with blood, and be brought to a condition which will bear a major operation.

The subject in acute or traumatic surgery which has received some commensurate consideration during the last year is fractures. This renewed discussion is probably due to the interest given the subject by the employment of X-rays, and the comparative accuracy with which the friends of the patient, as well as the surgeon, may now determine how well the bone has been "set." In this field the writer predicts that radiographs are likely to be disturbing factors as well as useful instruments, and that they will multiply suits for malpractice and damages until a long series of investigations and observations shall prove that it is the exception and not the rule for the surgeon to be able to make exact coaptation and retention of the bony fragments after a so-called simple fracture. The general tendency of to-day is the simplification of apparatus, and the allowance of more freedom of motion and locomotion in the treatment of fractures. Of far greater importance, however, is the gradually growing belief that the majority of so-called "simple fractures" are far from being so indeed, and that explorations by incision and adjustments of fragments by sight are not only justifiable, but in many instances absolutely essential for proper treatment. An accumulating array of instances has shown these incisions do not augment the danger when the operation is done with proper aseptic precautions, and that they markedly improve the results of treatment. The open method of treating fractures in proper cases is now not only the safe method, but the proper and imperative method of handling many fractures.

The most opportune and most suggestive paper of the year was the one read before the Practitioners' Society of New York, by Dr. McBurney, on "When to Operate." This is a vital question in surgery, and one which in many cases is far from settled. This is also a question in which surgeons ought to strive to indoctrinate family practitioners, for upon them in many instances this matter bears most heavily. Many organs and members have been sacrificed, and many lives lost because the medical man in charge had not made up his mind, or did not know when to operate. The discussion of Mr. Marmaduke Shields' paper on "Immunity and Latency After Operations for Cancer of the Breast,"* before the Royal Medical and Chirurgical Society of England, by such men as Pearce Gould, Watson Cheyne, W. H. Bennet and Fred Treves, shows that the whole question of cancerous invasion, growth, and cure are far from settled, even in the most maturely thoughtful and progressive minds. It is generally conceded now-a-days, however, that preceding what may be called the invasion

*Lancet, Feb. 26, 1898.

of cancer, there is a pre-cancerous stage and that cure may be confidently expected if the tumor be thoroughly removed during this first stage. This fact ought to be thoroughly established, and be received by the whole profession as a matter of the most vital importance. Family physicians should be made to believe that an incipient tumor should at once be submitted to the judgment of a surgeon, and that it is criminal to allow a patient to wait until ulceration or enlarged lymphatic glands disclose the growth to be malignant. These pathognomonic signs also declare in many instances, the death sentence of the unfortunate patient; they indicate, also, that an extensive operation must be done, and the chances of recurrence at this time are greater than those of thorough eradication.

The removal of benign tumors ought also to be done as early as possible. Constant irritation, growth under pressure, or some dyscrasia of the patient operate to make simple papillomata; fibroids and adenomata take on sarcomatous (myxomatous) degenerations, and the borderlands are so close that it is rarely ever safe to permit these tumors to develop as they will. It is far simpler, easier, and safer to remove these tumors in their very early growth, and it should be done.

The danger of general tubercular infection from a single focus of invasion is too little appreciated by physicians. The persistent enlargement of lymphatic glands, especially about the necks of children, those of diathetic parents especially, should receive early attention, and the knife ought to be used before they break down and suppurate. Inflammations involving the bones of diathetic children, especially a condition suggesting an osteomyelitis, require early radical operations. Many bones and limbs may thus be saved.

Now-a-days intestinal obstruction from any cause, but especially the so-called mechanical ones and those from hernia, should not be allowed to go on until a "typhoid" condition and fecal vomiting indicate that profound septicæmia and gangrene of the gut have taken place. Dr. Fred Krammerer, of New York, has called attention recently to a sign which nearly every surgeon of much experience has noticed, namely, circumscribed peristalsis, which if apparent to the sight at a very much distended point of the abdomen, is indicative of complete obstruction. When this sign is observed with the other ordinary signs and symptoms of obstruction, no time should be lost in performing an operation.

One would suppose that the much-written subject appendicitis had been so thoroughly discussed that little remains to be said on the matter of when to operate, and yet I dare say it is the experience of nearly every surgeon in active practice

to see cardinal rules neglected nearly every week. It is so well established that unless a case of appendicitis improves in forty-eight hours an operation is imperative, one is astonished to find so many cases allowed to suffer, and in many instances to die, because this rule is neglected or not known. Furthermore, the very important rule that an operation between attacks ought to be performed after a recurring attack of appendicitis of even a mild (so-called catarrhal) type, is entirely too often neglected.

Recent work in renal surgery has shown the great good of early operative exploration, and removal of calculi from the pelvis of the kidney. As soon as persistent and recurring pain, and microscopic and chemic examination of the urine, obtained separately by ureteral catherization, have determined the probable presence of a stone in the kidney, an early removal of the stone will save the organ and restore the patient to health. It is of vital importance to remove a tubercular kidney as soon as the diagnosis can be made, and the other kidney determined to be healthy.

Later teaching and clinical experience show the great importance of early operation in obstruction of the bile ducts—especially the common duct. To wait for persistent jaundice with frequent rigors, high temperatures and frequent vomiting, before determining to operate, exposes the patient to fatal septicæmia, and complicates the operation by inflammatory adhesions, besides the great danger of perforation and general septic peritonitis.

I might continue these instances beyond your patience to hear. I trust I have said enough, however, to suggest to you the very great importance of recognizing the proper time for operating, and how vital it is in many instances not only to know this, but to faithfully and firmly practice it. There are a great many conditions, unfortunately, which remain still in doubt. To the study of these, surgeons should now give more attention. In order to know when to operate in any given case, it is necessary to fully understand and to appreciate the pathology of the disease or traumatism, as well as its clinical history; this feature of surgical investigation is too much neglected, especially in our country.

A recent notice of Stephen Paget's book on John Hunter, which appeared in the *Philadelphia Medical Journal*,* very aptly sums up what seems to me the lesson to be learned from a review of the year's work in surgery. It says: "The lesson of Hunter's life was never more needed than to-day, when mechanical conceptions of surgery are so dominant, and when technic has so largely replaced pathology." Improved technique has unquestionably greatly widened the bounds of

*Philadelphia Medical Journal, March 26, 1898.

surgery, and opened up vistas which to the daring and pushing surgeon seem well-nigh illimitable. The field of the general surgeon is encompassing that formerly sacred to the gynæcologist, and now encroaches upon the domain formerly given over wholly to the physician. Are we not going a little too fast? Empirical precedents and undigested observation and experience do not furnish stable ground-work for lasting scientific facts. It seems to me we are in grave danger of outrunning physiologic and pathologic investigations in many surgical attempts. It is time "to cast an anchor to the windward" and wait for proper observations and the careful working out of our present location and bearings. Surgeons, of the United States especially, very much need more laboratories and fewer clinics.

Besides the prevalence of "mechanical conceptions of surgery," another serious matter is that the furor for operating and the lust for extirpations have taken fast hold upon us. The surgeon who can not enumerate his cases of organs removed by the scores is a beginner indeed, and has but reached the stage where he must rush into print with a new device or "an improved method" for a pusher on the high road leading to his century count! Radicalism has been rampant; it is high time painstaking, thoughtful and scientific conservatism should have a fair chance.—*Pennsylvania Medical Journal.*

XUM

A CASE OF PSEUDO-HERMAPHRODISM.

BY DRS. R. SOREL AND M. CHEROT.

Although similar cases are not absolutely rare, the authors deem the report of the above case sufficiently interesting for publication because of the opportunity of following it to the autopsy.

A. C., bar-maid, residing at Havre, was a vigorous-looking individual, muscular, of medium height, and about 36 years old. She had received a girl's education and had always passed as a member of the female sex. She had never menstruated. Her figure was rather masculine in shape. Since the age of 21 a black growth of hair about the lips and chin, although rather scanty, had necessitated resort to shaving. The mammary glands were undeveloped. A considerable hairy growth on the lower limbs was present. General aspect, gait, and voice were those of a man.

In the place of the clitoris this person had a projection emerging at the point of separation of the labia majora. This terminated in an imperforate glans penis of normal size and shape. The projecting fleshy mass was 5½ cm. long and measured 6 cm. in circumference at the root. Beneath it a short band prevented complete erection. This band was lost in two large labia, which were well formed and covered with hair. Between them and beneath the roots of the projection the urethra was visible. In the labia majora no sign of testicles were discoverable, and between them no sign of vulvar or vaginal orifice could be made out. * * * Although of a frigid disposition this person had erections with a desire, which however was never satisfied, of attempting intercourse with women.

Two years previously she received a blow in the right side of the abdomen which caused a severe pain for a number of days. At the time of writing she was sick six weeks with a pain in the right abdominal region. With this she complained of loss of appetite, vomiting and slight diarrhea. * * * On admission to the hospital an abdominal tumor was discovered extending from the right loin to the median line and from three finger-breadths below the liver to the iliac fossa.

On opening the abdomen a half-litre of brown feculent pus escaped. With the finger in the wound cancer of caecum was diagnosticated. On the following day the dressing was soiled with abundant fecal matter and the patient died early the next morning.

The autopsy showed invasion of the right side of the abdomen by a vast cancerous growth, purulent collections, and

generally peritonitis. The search for testicles, uterus, tubes, ovaries and ligaments proved futile. The bladder was relatively small. Behind the bladder a pocket, 8 cm. x 6 cm., was found lined with mucous membrane and filled with liquid. At its lower portion it communicated with the urethra. On the the peritoneal surface below to either side the ureters were discovered. Testicles could be found nowhere. The urethra w s short like that of a female. No prostate gland present. The seminal vesicles were found.—*The Post-Graduate.*

Books Received.

White's Materia Medica and Therapeutics. Wilcox. P. Blakiston's Son & Co.

Handbook of Practice of Medicine. Taylor. P. Blakiston's Son & Co.

Osler's Practice of Medicine, Third Edition. D. Appleton & Co.

Practical Urinalysis and Urinary Diagnosis. By Charles W. Purdy, M.D., LL.D., Fourth Edition. The F. A. Davis Com, pany, Philadelphia.

Primer of Psychology and Mental Disease. C. B. Burr, M.D., second revised edition. The F. A. Davis Company. Philadelphia.

Physicians' Visiting List for 1899. P. Blakiston's Son & Co., Philadelphia.

Morris' Anatomy, Second Edition. P. Blakiston's Son & Co.

XUM

Editorial.

Dr. F. Bartow McRae, a former resident of Atlanta, died at Lumber City, Ga., November 17.

One Wm. Smith, an osteopath, has brought suit against the *Medical Age* of Detroit, Michigan, for $25,000 damages for alleged defamation of character. The publisher of the *Age*, Mr. Warren, promises to fight the suit *a l'outrance*. As Mr. Warren is on the side of the medical profession, he deserves the support of the medical press in his war against irregulars. We have no doubt of the outcome of the preposterous suit.

INCOMPLETE COITION.

Apologies are due the reader for the introduction of rather a nasty subject. Ten years ago such a t pic would have been tabooed, but now progress or retrogression, as the case may be, may say with the man of Destiny, *vous avons change tout cela*. It would seem from the increased frequency of allusions in the medical press to incomplete coition, or what the Germans call coitus reservatus vel interruptus, and which means withdrawal of the male member from the vagina before ejaculation, that more than usual attention is now being claimed for it.

It is said to be productive of numerous ill consequences to both participants in the act.

In the man, sooner or later, more or less profound symptoms of neurasthenia present themselves, while in the woman the pernicious effects of the practice are evidenced in a condition of general ill health and in pelvic congestion. The rationale of the influence of interrupted coition upon the woman is that erythism is aroused to a certain point without being brought to completion, so that she is not only deprived of the relaxing effect upon the congested organs concerned consequent upon

that explosion of energy known as the orgasm, but of the tonic (sic) properties of the semen. One writer says: "When I go in a house and see a husband sleek, fat, jolly and hearty, and the wife pale, anæmic and nervous, if she has no definite disease, I can easily guess the cause—incomplete coition."

Now, take the facts on the other side: Is there any physiological difference on the part of the male between intra and extra vaginal ejaculation? In either instance the sexual act is complete. There is no interchange of secretion between the male and female organs concerned in the act by means of which there is a mutual replacement of that lost. There may be a mental sense of incompleteness; physically there is none.

If a man make demands upon his wife that are inordinately frequent it is convincing evidence that the natural polygamous instincts of the male of our species will lead him to find his pleasure outside of its legitimate field, and as a consequence almost inevitable will come that arch destroyer of human happiness, gonorrhœa. We know too well the far-reaching malevolent influence upon women of neglected gonorrhœa in their consort. Then why not look to that as the cause of the thin, nervous, worried, careworn looking wife than to the passing fad of the moment?

The old and well established tubal and ovarian disease of gonorrhœa origin, the lacerated cervices, endometritis, subinvolution are more often the factors that bring about premature senility in women than unorthodox methods of coition.

Incomplete coition is unnatural and abhorrent, but sentimentalists will have a difficult task in suppressing a practice which has such a fixed position in the economics of procreation.

BUSINESS DEPARTMENT.

Address all letters relative to business matters and make all money orders payable to B. M. Zettler.

If the SOUTHERN MEDICAL RECORD is sent to any one who does not wish it, or beyond the time he intends to pay for it, the manager must be informed directly to stop it. It will not be sent knowingly to any one who does not wish it, but if notice is not given to discontinue, payment will be required for the time it is sent.

ATTENTION.—All communications and all matters pertaining to this department must reach us by the 20th of the month to insure insertion in the following month's issue.

Special Notes.

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GEO. R. DUNCAN, M.D.,
Fall Branch, Tenn.

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J. R. WILCOX, M.D.

Colorado Springs, Col.

Dr. N. Allen Heaton, Washington, D. C., writes:

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